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of the

American Veterinary Medical Association

Formerly AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Assn.)

H. Preston Hoskins, Secretary-Editor, 221 N. LaSalle St., Chicago, Ill.

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MAY, 1936

No. 5

LOOKING AHEAD

The year 1938 will mark at least two important events in the veterinary world. One of these is the Thirteenth International Veterinary Congress, to be held in Berne, Switzerland, plans for which are already being made. The other event on the 1938 calendar is the seventy-fifth anniversary of the organization of the American Veterinary Medical Association. The fiftieth anniversary was celebrated in New York in 1913 and it is not too early to begin thinking about how, where and when the 1938 meeting should be held. It is a foregone conclusion that a large number of veterinarians from the United States will want to attend the International Veterinary Congress in Berne in 1938, having had their appetites for these gatherings whetted by the Congress held in New York in 1934. For this reason the dates for the 1938 convention of the A. V. M. A. should be arranged with a view to making it possible for veterinarians in the United States and Canada to attend both the A. V. M. A. meeting and the Congress in Berne. On accounts of these conditions, it would appear logical to hold the 1938 meeting in the East. All of the

invitations which have been received for 1937 are from the West, and if one of these should be accepted at Columbus, in August, there would be another reason for meeting in the East in 1938. California has invited the A. V. M. A. to meet in San Francisco in 1938, when the opening of the Golden Gate bridges is to be celebrated, but the latest information is that this gigantic project may not be completed until 1939. As to the "how" of celebrating the seventy-fifth anniversary of the A. V. M. A., all we can say at this time is that we should start planning now to make it the greatest event in veterinary history in this country.

EXECUTIVE BOARD ELECTIONS

The primary elections held in Executive Board Districts 6 and 8 came to a close on April 11 and during the week of the 13th ballots were mailed to all members of the A. V. M. A. in good standing in the two districts, which comprise the Southwest.

The election in District 8 (Kansas, Missouri, Oklahoma, Arkansas, Texas and Louisiana) follows right on the heels of the special election held in the same district a few months ago. Some members have been a little confused by the two elections and considerable correspondence has been necessary to explain the purpose of the special and regular elections. Four of the five candidates nominated in the special election were nominated in the regular election.

In District 6 (California, Nevada, Utah, Colorado, New Mexico, Arizona, Mexico, Central America and the Canal Zone) the election is the regular one held every five years. As in District 8, the successful candidate will start his term at the close of the annual meeting in Columbus. Four of the five nominees are from California and the fifth is from Colorado.

Among the ten candidates, listed below, are to be found representatives of the principal branches of the profession, all active in A. V. M. A. affairs and well known both in their respective districts and throughout the country.

DISTRICT 6

ARBURUA, J. M.

San Francisco, Calif.

Practitioner. Graduate of San Francisco Veterinary College, 1915. Joined A. V. M. A., 1915. Member of Committee on Resolutions, 1935-.

HARING, C. M.

Berkeley, Calif.

Professor and head of Division of Veterinary Science, University of California. Graduate of Cornell University, 1904. Joined A. V. M. A., 1904. Member of Committee on Diseases, 1912-15. Secretary, 1915-16. Second vice-president, 1917-18. Resident secretary for California, 1919-20. Member of Committee on Necrology, 1925-26. Member of Committee on International Veterinary Congress, 1928-34. Member of Committee on Resolutions, 1933-34.

HAYES, F. M.

Davis, Calif.

Professor of Veterinary Science, University of California. Graduate of Kansas State College, 1908. Joined A. V. M. A., 1909. Member of Committee on Abortion, 1921-22. Chairman of Section on Education and Research, 1924-25.

HURT, L. M.

Los Angeles, Calif.

County Live Stock Inspector. Graduate of Iowa State College, 1904. Joined A. V. M. A., 1908. Chairman of Committee on Local Arrangements, 1929-30. Member of Executive Board, 1931.

NEWSOM, I. E.

Fort Collins, Colo.

Dean of Division of Veterinary Medicine, Colorado State College. Graduate of San Francisco Veterinary College, 1906, and Kansas City Veterinary College, 1909. Joined A. V. M. A., 1909. Resident secretary for Colorado, 1910-13; 1915-19; 1921-22; 1926-31 and 1933-34. Member of Committee on Revision of Anatomical Nomenclature, 1912-17 and 1918-20. Member of Committee on Prevention of Transmissible Diseases of Animals, 1921-24. Fifth vice-president, 1924-25, and fourth vice-president, 1931-32.

DISTRICT 8**ALLEN, L. J.**

Oklahoma City, Okla.

Inspector-in-charge, U. S. Bureau of Animal Industry. Graduate of Ontario Veterinary College, 1895. Joined A. V. M. A., 1918. Resident secretary for Oklahoma, 1919-21. Member of Executive Board, 1936.

BOWER, C. W.

Topeka, Kan.

Practitioner. Graduate of Kansas State College, 1918. Joined A. V. M. A., 1918. Resident secretary for Kansas, 1927-28 and 1933-34. Chairman of Section on Small Animals, 1928-30.

HISEL, C. C.

Oklahoma City, Okla.

State Veterinarian of Oklahoma. Graduate of Kansas City Veterinary College, 1916. Joined A. V. M. A., 1930. Resident secretary for Oklahoma, 1931-32. Chairman of Committee on Local Arrangements, 1934-35.

HORNING, J. G.

Houston, Tex.

Practitioner. Graduate of McKillip Veterinary College, 1913. Joined A. V. M. A., 1925. Member of Special Committee on Distemper, 1926-27. Resident secretary for Texas, 1934.

LOCKHART, ASHE

Kansas City, Mo.

President, Ashe Lockhart, Inc. Graduate of Kansas City Veterinary College, 1915. Joined A. V. M. A., 1916. Member of Committee on Audit, 1921-22. Chairman of Committee on Veterinary Biological Products, 1924-25. Member of Special Committee on Distemper, 1926-27 and 1930-32. Resident secretary for Missouri, 1933-1935. Member of Executive Board, 1935-36.

COLUMBUS, THE GATEWAY CITY

Columbus, the A. V. M. A. 1936 convention city, is situated at the handle of a great fanshaped expanse of flat land extending to the west and southwest in the state of Ohio, which is strategically located between the Appalachian Plateau and the Great Lakes. This topography has been potent in determining the concentration of population, until today it exceeds 340,000, and the position of Columbus is dominant in relation to great producing and consuming centers.

Early pioneers traveled westward over the Appalachian Mountains following the old buffalo trails and settled where Columbus now stands. Ohio became a state in 1803, but it was not until 1812 that a law was passed establishing Columbus as the capital. Ohio is the only state east of the Rockies whose population passed the two million mark within one generation. This movement of people preceded the flow of commodities and was the beginning of what rapidly developed into the "mid-continental trade track." Columbus, today, with its various modes of transportation—rail, air and highway—is the gateway to the heart of the United States and occupies a dominating position in the vast commercial life of Ohio. A. V. M. A. members, make your plans now for attending the convention in Columbus, August 11-12-13-14!

PROFESSOR LECLAINCHE WRITES A BOOK

Professor E. Leclainche, distinguished French veterinarian, has written a "History of Veterinary Medicine," which is reviewed at length in this issue of the JOURNAL. A copy of this timely work has been graciously forwarded to the A. V. M. A. and inscribed: "To the American Veterinary Medical Association, for the eminent services which it has rendered to our profession in the United States and throughout the world." It is hoped that someone will translate Professor Leclainche's masterpiece into English, as the book contains much information that every veterinarian in this country should have.

DEAN STANGE DIES SUDDENLY

Just as the forms for this issue of the JOURNAL are being closed, word comes of the sudden death of Dr. C. H. Stange, at Ames, Iowa, on April 26. No details are available, but cardiac thrombosis is reported as the cause of death. Dr. Stange had

been Dean of the Division of Veterinary Medicine, Iowa State College, since 1909, and his 27 years of service in this position ranked him as the oldest veterinary dean in the country. Dr. Stange served the A. V. M. A. as president, 1923-24, and his death was the fourth among our past presidents in about a year, following Dr. C. A. Cary, about a year ago; Dr. W. H. Welch, in October, and Dr. T. E. Munce, in March. Dr. Stange served as member of the Executive Board for eight years and chairman for three terms. A full obituary will be published next month.

Connecticut Makes It 39

With the addition of Connecticut to the list of tuberculosis-free states on April 1, the number reached 39. For some time now, it has been easier to name the states that are not accredited than to name those that are in the preferred group. Only nine states now remain to be cleaned up. They are:

California	New Jersey	Rhode Island
Maryland	New York	South Dakota
Nebraska	Pennsylvania	Vermont

It will be noted that three of these are west of the Mississippi River, two are in New England, and the four others form a contiguous group in the Middle Atlantic States.

Chappel Award for Distinguished Service

Announcement has been made by the Chappel Foundation at Rockford, Illinois, that the third Chappel Award for Distinguished Service to American Dogdom will be presented the early part of 1937, possibly at the time of the Westminster Show, to the outstanding figure in the dog world during 1936.

Nominations for the Award may be made during the coming months, the closing date being November 15, 1936. The final selection of the recipient of the beautiful bronze plaque will be made by a group of five judges, to be named at a later date.

The two previous awards were presented to Mr. George F. Foley and Mr. James W. Spring. Both of these men have done much to further the best interests of the dog in America, and their choice for the Chappel Award was gratifying to all dog fanciers.

Who is your choice for the 1936 Chappel Award for Distinguished Service to American Dogdom? You may address your nominations to the Chappel Foundation, Rockford, Ill.

APPLICATIONS FOR MEMBERSHIP

Last month, in discussing our membership campaign, we suggested that you keep your eyes on Ohio. Well, the Buckeye State came through with twelve applications the past month, boosting the total for the month to 34, the largest number for the corresponding month in any year since 1929. Incidentally, Ohio jumped into first place, sending South Dakota into second place. California and Pennsylvania held their own. They are now in third and fourth places, respectively.

During the first four months of 1936, there were 124 applications for membership received, which is just a little bit better than one a day. We would like to maintain this rate right up to the Columbus meeting. If we do, it will mean over 300 new members during the administration of President Flynn. It can be done easily if everybody will help just a little bit.

Here are 34 more veterinarians who want to be identified with the A. V. M. A.:

(See January, 1936, JOURNAL)

FIRST LISTING

- | | |
|-------------------------|--|
| ANDERSON, GRANT W. | Clemson College, Clemson, S. C.
B. S., D. V. M., Iowa State College, 1932
M. S., Virginia Polytechnic Institute, 1934
Vouchers: I. D. Wilson and E. P. Johnson. |
| BAMBER, SAMUEL D. | Van Kirk Apts., Herkimer, N. Y.
D. V. M., Cincinnati Veterinary College, 1917
Vouchers: L. R. Sullivan and R. L. Stephenson. |
| BOWEN, WILLIAM C. | Richwood, Ohio
D. V. M., Ohio State University, 1931
Vouchers: W. F. Guard and Leonard W. Goss. |
| COLLINS, LT. WILLIAM F. | Fort Sill, Okla.
D. V. M., Iowa State College, 1934
Vouchers: Lt. Col. Daniel B. Leininger and Maj. Harry L. Watson. |
| COMPTON, LYLE S. | S. Center St., Clymer, N. Y.
D. V. M., Cornell University, 1931
Vouchers: William A. Dennis and I. M. Moulthrop. |
| COURT, MAURICE J. | Lowell, Mich.
D. V. M., Michigan State College, 1934
Vouchers: C. F. Clark and B. J. Kilham. |
| DANNLEY, GEORGE R. | 233 Maple St., Ashland, Ohio
B. V. Sc., Ontario Veterinary College, 1914
Vouchers: W. F. Guard and W. R. Krill. |
| DOUGLASS, ARDEN H. | Union Stock Yards, Los Angeles, Calif.
D. V. M., Kansas City Veterinary College, 1916
Vouchers: Wm. A. Clark and L. F. Conti. |
| EPPERSON, MARVIN E. | 620 N. Market St., Galion, Ohio
B. V. Sc., Ontario Veterinary College, 1933
Vouchers: W. F. Guard and Leonard W. Goss. |

- EVANS, ROBLEY 239 E. Main St., New Holland, Pa.
V. M. D., University of Pennsylvania, 1934
Vouchers: H. W. Barnard and G. A. Dick.
- EVANS, LT. TOM Hdqrs. CCC, Albuquerque, N. M.
D. V. M., Colorado State College, 1928
Vouchers: F. L. Schneider and Maj. O. C. Schwalm.
- FIRTH, LENDALL K. 50 E. Buchtel Ave., Akron, Ohio
D. V. M., Kansas State College, 1933
Vouchers: J. F. Planz, C. H. Case and W. F. Guard.
- GIBSON, BERNARD H. Newark, Ohio
D. V. M., Ohio State University, 1935
Vouchers: W. F. Guard and W. R. Krill.
- HICKEY, JAMES C. Pine Forge, Pa.
D. V. M., Alabama Polytechnic Institute, 1935
Vouchers: I. S. McAdory, F. D. Patterson and L. A. Pratt.
- KUTSHER, LINCOLN G. 2 Ash Dr., Great Neck, L. I., N. Y.
V. M. D., University of Pennsylvania, 1934
Vouchers: L. W. Goodman and J. Stuart Crawford.
- LEENERTS, LT. THEODORE H.
Presidio of San Francisco, San Francisco, Calif.
D. V. M., Colorado State College, 1931
Vouchers: Capt. E. L. Watson and Maj. J. H. Kintner.
- MCCLARREN, ROBERT L. 1957 E. Main St., Columbus, Ohio
D. V. M., Ohio State University, 1922
Vouchers: W. F. Guard and Leonard W. Goss.
- McMICHAEL, LT. WILLIAM W. 3712 Bisbee St., El Paso, Texas
D. V. M., Colorado State College, 1935
Vouchers: I. E. Newsom and Maj. O. C. Schwalm.
- MADDEN, ANSON G. Madeira, Ohio
D. V. M., Ohio State University, 1934
Vouchers: W. F. Guard and Leonard W. Goss.
- MANGES, LT. JOSEPH D. Courtland, Kans.
D. V. M., Kansas State College, 1935
Vouchers: O. E. Robinson, Roy T. Fisher and R. R. Dykstra.
- MARCHAND, GEORGE U. 526 Walnut St., Uhrichsville, Ohio
V. S., Ontario Veterinary College, 1905
Vouchers: W. F. Guard and Leonard W. Goss.
- MERRITT, LLOYD C. Sumter, S. C.
D. V. M., Indiana Veterinary College, 1918
Vouchers: M. R. Blackstock and Frank Kitchen.
- MEYER, JOSH F. Gardner, Colo.
D. V. M., Colorado State College, 1935
Vouchers: I. E. Newsom and E. N. Stout.
- MORRILL, CHARLES C. Kansas State College, Manhattan, Kans.
D. V. M., M. S., Michigan State College, 1935
Vouchers: R. R. Dykstra and H. F. Lienhardt.
- PARKER, ROBERT M. DeFuniak Springs, Fla.
D. V. M., Iowa State College, 1934
Vouchers: J. J. Vara and E. L. Reed.
- ROOKS, ELMER L. 343 N. Fifth St., Greenfield, Ohio
D. V. M., Ohio State University, 1932
Vouchers: W. F. Guard and Leonard W. Goss.
- RUSSELL, FOSTER D. Presho, S. Dak.
D. V. M., McKillip Veterinary College, 1914
Vouchers: E. L. Harvey and M. M. Davis.

- SCOTHORN, MARION W. Ashville, Ohio
D. V. M., Ohio State University, 1933
Vouchers: Walter R. Krill and J. H. Knapp.
- SIEMER, LT. EVERRETT J. Hdqrs. CCC, Silver City, N. M.
D. V. M., Colorado State College, 1933
Vouchers: Maj. O. C. Schwalm and F. L. Schneider.
- STAFFORD, CHARLES D. Novato, Calif.
D. V. M., Kansas State College, 1935
Vouchers: E. E. Leasure and S. T. Michael.
- TAYLOR, STANLEY E. 241 Lexington Ave., Mansfield, Ohio
D. V. M., Ohio State University, 1930
Vouchers: W. F. Guard and Leonard W. Goss.
- THRASH, AI C. Lost Creek, W. Va.
D. V. M., McKillip Veterinary College, 1916
Vouchers: S. E. Hershey and H. M. Newton.
- WELLER, ROBERT R. R. 5, Box 627-A, Tacoma, Wash.
B. S., D. V. M., State College of Washington, 1934
Vouchers: C. E. Sawyer and A. C. Jerstad.
- WISEMAN, ORVILLE G. 15717 Brewster Rd., East Cleveland, Ohio
D. V. M., Ohio State University, 1924
Vouchers: H. E. Myers and A. L. Miller.

Applications Pending

SECOND LISTING

(See April, 1936, JOURNAL)

- Antle, F. F., De Smet, S. Dak.
Atwood, George B., Arlington, S. Dak.
Barber, Clifford W., Colorado State College, Fort Collins, Colo.
Beebe, Lyle H., Warrensburg, Mo.
Byron, J. P., Bristol, S. Dak.
Cellar, Paul M., 2004 Quarrier St., Charlestown, W. Va.
Curtis, John I., 240 W. Center St., Richfield, Utah.
Fitzgerald, Theodore C., 2710 Zollinger Rd., Columbus, Ohio.
Fritts, Kenneth H., Humboldt, S. Dak.
Graybill, Guy M., 604 Shoemaker Ave., Jenkintown, Pa.
Hinkley, J. L., Salem, S. Dak.
Jewell, Harold J., 125-127 West 23rd St., Oklahoma City, Okla.
Lawrence, Michael P., 37-19 Junction Ave., Corona, L. I., N. Y.
Madsen, Peter E., 302 Federal Bldg., Cheyenne, Wyo.
Malloy, Francis A., c/o Eugene Sullivan, Montrose, S. Dak.
Miller, Albert R., 625 6th St., Brookings, S. Dak.
Mouw, John E. B., Garretson, S. Dak.
Pierce, Foster H., Ipswich, S. Dak.
Pollman, Gerhart A., Freeman, S. Dak.
Sadler, Kenneth E., Wagner, S. Dak.
Saint Clair, Lorenz E., Colorado State College, Fort Collins, Colo.
Smith, Kenneth W., Lewiston, Utah.
Stiles, John E., 613 S. Vienna St., Ruston, La.
Swail, Lawrence H., 10810 84th Ave., Edmonton, Alta., Can.
Taylor, Rex, 44 S. Fourth St., San Jose, Calif.
Truman, Lewis R., Bryant, S. Dak.
Vierling, Clarence C., Winterset, Iowa.
Warne, Clyde J., Lake Preston, S. Dak.

The amount which should accompany an application filed this month is \$8.33, which covers membership fee and dues to January 1, 1937, including subscription to the JOURNAL.

COMING VETERINARY MEETINGS

- Inland Empire Veterinary Medical Association. State College of Washington, Pullman, Wash. May 2, 1936. Dr. E. M. Gildow, Secretary, University of Idaho, Moscow, Idaho.
- Connecticut Veterinary Medical Association. Dr. Edwin Laitinen's Hospital, 993 N. Main St., West Hartford, Conn. May 6, 1936. Dr. Geo. E. Corwin, Secretary, State Office Bldg., Hartford, Conn.
- New York City, Veterinary Medical Association of. Hotel New Yorker, 8th Ave. and 34th St., New York, N. Y. May 6, 1936. Dr. R. S. MacKellar, Jr., Secretary, 329 W. 12th St., New York, N. Y.
- North-Central Iowa Veterinary Association. Hotel Warden, Fort Dodge, Iowa. May 6, 1936. Dr. H. C. Smith, Secretary, 2015 Eighth Ave. N., Fort Dodge, Iowa.
- Saint Louis District Veterinary Medical Association. Melbourne Hotel, Saint Louis, Mo. May 6, 1936. Dr. Milton R. Fisher, Secretary, 4405 W. Pine St., Saint Louis, Mo.
- Houston Veterinary Association. Houston, Texas. May 7, 1936. Dr. D. B. Strickler, Secretary, 317 Federal Bldg., Houston, Texas.
- Ak-Sar-Ben Veterinary Medical Association. Elks Building, Omaha, Neb. May 9, 1936. Dr. J. N. McIlnay, Secretary, 3251 Leavenworth St., Omaha, Neb.
- American Association of Medical Milk Commissions. Joint meeting with Certified Milk Producers' Association. Baltimore Hotel, Kansas City, Mo. May 11-12, 1936. Dr. Paul B. Cassidy, Secretary, 1265 Broadway, New York, N. Y.
- American Society of Clinical Laboratory Technicians. The Elms, Excelsior Springs, Mo. May 11-13, 1936. Miss Madie Murphy, Secretary, Hillman Hospital, Birmingham, Ala.
- Chicago Veterinary Medical Association. Palmer House, Chicago, Ill. May 12, 1936. Dr. O. Norling-Christensen, Secretary, 1904 W. North Ave., Chicago, Ill.
- San Diego County Veterinary Medical Association. San Diego, Calif. May 12, 1936. Dr. L. K. Knighton, Secretary, 3438 Mountain View Drive, San Diego, Calif.
- Hudson Valley Veterinary Medical Society. Catskill, N. Y. May 13, 1936. Dr. J. G. Wills, Secretary, Box 751, Albany, N. Y.
- Southeastern Michigan Veterinary Medical Association. Detroit, Mich. May 13, 1936. Dr. F. D. Egan, Secretary, 17422 Woodward Ave., Detroit, Mich.

- Willamette Valley Veterinary Medical Association. Albany, Ore. May 13, 1936. Dr. Elwyn W. Coon, Secretary, Forest Grove, Ore.
- Michigan-Ohio Veterinary Medical Association. Blissfield, Mich. May 14, 1936. Dr. E. C. W. Schubel, Secretary, Blissfield, Mich.
- Kansas City Veterinary Association. Baltimore Hotel, Kansas City, Mo. May 19, 1936. Dr. C. C. Foulk, Secretary, 1103 E. 47th St., Kansas City, Mo.
- Southern California Veterinary Medical Association. Chamber of Commerce Building, Los Angeles, Calif. May 20, 1936. Dr. L. E. Pike, Secretary, 1220 Bennett Ave., Long Beach, Calif.
- Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa. May 27, 1936. Dr. J. A. Mehan, Secretary, 39th St. & Woodland Ave., Philadelphia, Pa.
- Colorado Veterinary Medical Association. Veterinary Hospital, Colorado State College, Fort Collins, Colo. May 27-29, 1936. Dr. B. R. McCrory, Secretary, Colorado State College, Fort Collins, Colo.
- Central New York Veterinary Medical Association. Genoa, N. Y. June 3, 1936. Dr. W. B. Switzer, Secretary, R. 5, Oswego, N. Y.
- Mississippi Valley Veterinary Medical Association. Williams Sale and Commission Building, 2220-36 S. Washington St., Peoria, Ill. June 4, 1936. Dr. Lyle A. Gray, Secretary, Bushnell, Ill.
- East Tennessee Veterinary Medical Society. White Surgical Supply Building, Knoxville, Tenn. June 6, 1936. Dr. Robert L. Hummer, Secretary, 312 W. Church Ave., Knoxville, Tenn.
- Northeastern Indiana Veterinary Medical Association. Tri-Lakes, Ind. June 14, 1936. Dr. H. O. Elliott, Secretary, Box 178, Orland, Ind.
- Arkansas Veterinary Medical Association. Mountain Inn Hotel, Fayetteville, Ark. June 15-16, 1936. Dr. T. M. Dick, Secretary, City Hall, Little Rock, Ark.
- Oklahoma Veterinary Medical Association. (Joint meeting with the Arkansas Veterinary Medical Association.) Fayetteville, Ark. June 15-16, 1936. Dr. C. H. Fauks, Secretary, 1719 S. W. 15th St., Oklahoma City, Okla.

American Association for the Advancement of Science. Rochester, N. Y. June 16-18, 1936. Dr. Henry B. Ward, Secretary, Smithsonian Institution Bldg., Washington, D. C.

Eastern Iowa Veterinary Association, Inc. Mechanicsville, Iowa. June 17, 1936. Dr. John J. Strandberg, Secretary, 1005 8th Ave., Belle Plaine, Iowa.

Idaho Veterinary Medical Association. Twin Falls, Idaho. June 22-23, 1936. Dr. E. M. Gildow, Secretary, University of Idaho, Moscow, Idaho.

California State Veterinary Medical Association. Del Monte, Calif. June 22-24, 1936. Dr. Cliff D. Carpenter, Secretary, 337 Central Ave., Los Angeles, Calif.

Michigan State Veterinary Medical Association. Michigan State College, East Lansing, Mich. June 23-24, 1936. Dr. Lloyd B. Scholl, Secretary, 810 Sunset Ave., East Lansing, Mich.

Missouri Veterinary Medical Association. Carthage, Mo. June 23-24, 1936. Dr. Ashe Lockhart, Secretary, 800 Woodswether Rd., Kansas City, Mo.

Vermont Veterinary Medical Association. Burlington, Vt. June 26-27, 1936. Dr. G. N. Welch, Secretary, 43 Union St., Northfield, Vt.

Northwestern Ohio Veterinary Medical Association. Tiffin, Ohio. June 28, 1936. Dr. Warren P. S. Hall, Secretary, Division of Health, 9 Ontario St., Toledo, Ohio.

American Veterinary Medical Association. Deshler-Wallick Hotel, Columbus, Ohio. August 11-14, 1936. Dr. H. Preston Hoskins, Secretary, 221 N. La Salle St., Chicago, Ill.

STATE BOARD EXAMINATIONS

Nebraska Bureau of Examining Boards. State House, Lincoln, Neb. June 29-30, 1936. Applications must be on file at the Bureau not later than 15 days prior to date of examination. Mrs. Clark Perkins, Director, Bureau of Examining Boards, State House, Lincoln, Neb.

Massachusetts Board of Registration in Veterinary Medicine. Department of Civil Service and Registration, Boston, Mass. June 30-July 1, 1936. Applications may be obtained from the Secretary. Dr. E. W. Babson, Secretary, Gloucester, Mass.

DEXTROSE THERAPY IN CANINE MEDICINE*

By OTTO STADER, Geneva, Ill.

It is very seldom, indeed, that we have placed in our hands a therapeutic agent for which there are as many legitimate uses as there are for dextrose. This is not hard to understand, however, when we consider that the greatest danger of any disease process is the tissue destruction that follows lack of proper nutrition and proper fluid balance.

Dextrose is the ultimate form into which all carbohydrates are converted before being utilized by the system. Sixty per cent of the protein as well as ten per cent of the fats are also capable of being converted into dextrose before ultimate utilization.

Dextrose has been aptly termed "the fuel of life's engine—the cell." That the parenteral administration of dextrose must have many advantages where the normal processes of ingestion, digestion and absorption are interfered with, must readily be apparent to even the casual observer of canine diseases.

In human medicine, it is now very generally agreed that the intravenous administration of dextrose solutions is an important and valuable therapeutic measure in a surprisingly large number of pathological conditions. In any serious diseased state, nothing could be much more basic or fundamental as supportive treatment than to supply a patient with food or water in such a form and by such a route that these are immediately available. Thus it is both logical and reasonable to expect that benefits should follow such treatment. That favorable effects have been demonstrated is shown by the widespread present-day use of dextrose phleboclysis in every branch of medicine and surgery.

Fleig, in 1907, was probably the first to advise and use sugars intravenously. In 1911, Kusch used dextrose intravenously as a source of nutrition. In America, Fisher, in 1915, used dextrose in the treatment of nephritis and, in 1917, Erlanger and Woodyatt used dextrose solutions intravenously to combat shock. Litsfield, in 1918, employed dextrose solutions in the treatment of pneumonia. His excellent results immediately caused a very intensive interest in this form of therapy and since that time knowledge of dextrose administration has increased very rapidly and has become widespread in its application to various pathological conditions.

*Presented at the seventy-second annual meeting of the American Veterinary Medical Association, Oklahoma City, Okla., August 27-30, 1935.

TERMINOLOGY

Before entering upon the specific indications for and uses of dextrose therapy, it would be well, perhaps, first to consider proper terminology with reference to this subject.

The term "glucose" has been in common usage to indicate what the Tenth Revision of the U. S. Pharmacopoeia of 1926 designates as "dextrose." True glucose is corn syrup composed of dextrose, maltose and dextrine plus water, and is absolutely not fit for intravenous use. It is well to become accustomed to proper nomenclature in order to avoid mistakes. Use the term "dextrose."

Dextrose is a monosaccharide produced by the hydrolysis of starch. It is white and crystalline in form, three-fourths as sweet as ordinary sugar and is neutral in reaction, but faintly acid when heated.

In considering the rationality of intravenous dextrose therapy, let us first consider seriously two primary factors: (1) What is the fate of dextrose injected intravenously as compared to dextrose administered orally? (2) The problem of post-injection reactions. Can they be prevented?

In answer to the first question, there is much experimental evidence to indicate that parenteral dextrose is handled by the system in the same way as dextrose, resulting from the natural processes of digestion.

Parenteral dextrose is capable of being polymerized and stored as glycogen and also of being catabolized into CO_2 and H_2O , during which process it acts as a source of heat and energy. One-half to three-quarters of the total energy of the body can be supplied with dextrose, which has been termed "the current cash of the metabolic bank."

Regarding the problem of post-injection reactions, this has received a great deal of attention by many workers. It is now most generally agreed that the chief cause of reactions in dextrose phlebotomy is not coupled with the dextrose fraction, provided the dextrose used is CP dextrose, nor coupled with the apparatus used in its administration, but is most decidedly caused by circumstances which are the result of bacterial activity in the water used in the manufacture of the dextrose solutions. These harmful substances are called "pyrogens." They can be removed from the water by triple distillation in a still so constructed as to prevent minute drops of the original water from passing over into the distillate. When such pyrogen-free water is used to make the dextrose solutions, post-infusion reactions

become a negligible factor. It is important, however, that the freshly distilled water be immediately sterilized after distillation and stored as one would any other bacteriologically free substance. This must be done in order that new pyrogens will not form as the result of renewed bacteriological activity.

Pure gum tubing and hard glassware are to be preferred in carrying out routine dextrose phleboclysis. These should be boiled well and then routinely washed with pyrogen-free water immediately before being used.

INDICATIONS FOR DEXTROSE THERAPY

In view of the fact that dextrose is used therapeutically in a variety of concentrations in order to meet most adequately the specific requirements in given cases, it seems best to consider the indications from the standpoint of (1) the dextrose fraction, (2) the water fraction, and (3) indications for both dextrose and water fractions combined.

It seems preferable to the writer to discuss the various pathological states rather than distinct disease entities, because a thorough understanding of the indications in the broader sense will permit greater versatility in its application in any specific disease.

INDICATION FOR THE DEXTROSE FRACTION

(1) As a means of supplying readily available food and energy under circumstances which preclude proper functioning of the normal processes of ingestion, digestion and absorption.

(2) As a means of combating the variety of acidosis called "ketosis," which is dependent upon insufficient dextrose catabolism which is common in connection with various conditions, specifically in all febrile diseases associated with starvation and toxic destruction of tissue, excessive exertion or prolonged chilling, preoperative and postoperative starvation; prolonged general anesthesia, and all other conditions of excessive metabolism.

(3) As a means of producing dehydration by osmotherapy (causing the migration of a solution until a state of equilibrium or physiological normality ensues, such as in the treatment of edemas, pneumonia and pleurisy; in heat prostration, to reduce cerebral congestion and intracranial pressure; in posterior paralysis of toxic etiology, to lessen spinal-cord edema and blockage. Dextrose is the most harmless agent that can be used in quantities which will affect an abnormal osmotic equivalent, thereby producing beneficial and remedial effects on various transudates.

(4) As a stimulant to the process of diureses, as in (a) nephritis, and (b) the treatment of certain varieties of metallic poisoning and other forms of toxicosis.

(5) As a means of supplementing, fortifying or increasing the functions of the liver, specifically: (a) As a prophylactic preoperative measure in the more radical procedures of surgery; (b) as a part of the active treatment of hepatic insufficiencies, and (c) as a prophylactic measure against liver injury by chloroform anesthesia or tetra-chlorethylene administration.

(6) As an indirect means of shortening the coagulation time of the blood.

(7) As an active means of combating hypoglycemia.

(8) As an active means of combating cardiac inanition in cases where the heart muscle is so depleted that it fails to respond to the regular routine of cardiac stimulus.

THE INDICATION FOR THE WATER FRACTION

In the management of all serious disturbances of a disease, a veterinarian should always think of fluid intake before thinking of food. The cells of the body are literally bathed in fluid and as the fluid content recedes, proper nutrition of the cells and removal of waste products is inhibited to a point where fatal auto-intoxication results. Do not permit, therefore, a great reduction in the volume of the circulating fluids for any length of time but provide early, by whatever remedy is required, for keeping the blood-vessels full.

The water fraction is indicated as a means of restoring the body fluid volume and combating a failing circulation in lieu of blood transfusions in conditions of profound toxemia, shock or hemorrhage.

Bablock and his associates have rather clearly demonstrated that shock is due chiefly to a loss of fluids rather than to a histamine-like toxic substances.

Cellular starvation and hypohydration resulting from severe vomiting and diarrhea, which are so frequently associated with serious disease conditions, can most adequately be offset by maintaining proper fluid balance and nutrition by dextrose phlebotomy. The tissue destruction, as the result of starvation, results in acidosis which, in turn, reduces the normal alkalinity of the blood and as this is further reduced, nervous irritability with depression of the medulla ensues, resulting in further vomiting. Thus we see produced a severe pathological cycle, which cycle, when permitted to continue, may reduce the sugar tolerance of

the body to a point where dextrose therapy or any other remedial measures are of no avail. Therefore, supply dextrose in water early in diseased conditions as a preventive measure against the vicious cycle.

In the management of gastro-intestinal disturbances, it is of interest to note that all food *per os* stimulates peristaltic activity, while the administration of dextrose into the body inhibits peristalsis.

It appears logical to the writer that of first importance in the treatment of gastro-intestinal disturbances is the matter of gastro-intestinal rest—the same procedure which we would pursue in the rational treatment of any other pathological entity. With the use of parenteral dextrose this now becomes a possibility. Before we were able to sustain the food and fluid requirements of the body by parenteral administration, it was impossible to employ gastro-intestinal rest effectively. Now, however, it is not necessary for the inflamed alimentary canal to be further irritated by food in order to sustain life.

INDICATIONS FOR BOTH THE DEXTROSE AND WATER FRACTIONS

As a means of supplying both water and nutrition to patients who can tolerate neither substance by mouth, and in whom, for one reason or another, the other channels of administration are not considered ample, specifically: (a) In cases of prolonged peritonitis and profound surgical sepsis; (b) in febrile diseases characterized chiefly by anorexia, severe continuous vomiting, severe diarrhea, or a combination of these factors, and (c) in the early postoperative period in the case of patients who either were victims of dehydration and inanition at the start or in whom the operative procedure itself was an extreme ordeal.

DISTILLED WATER VS. NORMAL SALINE SOLUTION AS A VEHICLE FOR DEXTROSE

Whenever a hypochloridemia exists (as evidenced by the lack of chloride elimination in the urine), infusions of 10 per cent dextrose in salt solutions are in order.

Hypochloridemia is a fairly constant factor when severe vomiting and purgation are part of the pathological picture. The salt requirements of the system are very essential but are not very high. Two grams of sodium chloride daily suffice for the average adult. One should, therefore, use discretion regarding the continuous infusion of physiological saline solution, remembering that with each litre of solution, we administer 8.5 grams of sodium chloride. The excess of sodium chloride that is given

by routine administration of physiological salt solution must be expelled by way of the kidneys, thereby inducing kidney irritations and diarrhesis.

It would appear, therefore, that when the chloride deficiencies have been compensated for, as evidenced by the presence of chloride in the urine, that further administrations of saline solutions are contraindicated, and that then plain distilled water should be used as the vehicle for dextrose.

A FEW SPECIFIC INDICATIONS FOR DEXTROSE THERAPY

As liver protection: A well-nourished liver is a well-protected liver against all forms of toxic substances to which it is so constantly subjected. It is extremely important that the liver should receive special protection, not only from the standpoint of combating disease but also for prolonged liver efficiency after the disease process has been conquered. Therefore, early dextrose therapy will, in many instances, prevent serious liver damage which would otherwise occur, greatly shortening the efficiency of liver function as well as the life of the patient.

In the administration of vermifuges such as tetrachlorethylene, which, when it is absorbed, immediately gains entrance to the liver by way of the portal circulation, much injury can be prevented to the liver by a 25 per cent dextrose administration before the use of the tetrachlorethylene.

In cardiac inanition: Here concentrated dextrose solutions (25 to 50 per cent) should be administered so as not to burden the weakened heart with the bulky fluid. After the cardiac muscles respond, larger quantities of less concentrated (10 per cent) dextrose solutions are more desirable as the fluid content is essential.

Dextrose as a stimulant to kidney functions: Dextrose is next to water as the most potent and least harmful of all diuretics. The ultimate elimination of the excess dextrose is the renal threshold. Leakage occurs only when the sugar content of the blood rises about 0.16 or 0.18 per cent. The renal threshold is of importance when dextrose solutions are given to combat hypohydration (that is, given to add water to the system). If the 5 per cent dextrose solution is given too rapidly, it acts as a decided diuretic, increasing the secretory action of the kidneys with a tremendous loss of the much-needed water. Where this type of administering is permitted, the original dehydration under these conditions may be increased to a much further extent. In all diffusible poisons, detoxification by renal stimulation

with dextrose and water are most valuable adjuncts to the usual gastric lavage.

THE USE OF DEXTROSE VIA OSMOTHERAPY

Five per cent dextrose in water is considered isotonic, that is, it has the same osmotic tension as that of the body fluids. However, when osmotic tension is lower than body fluids, it is called hypotonic and when osmotic tension is greater, we call it hypertonic.*

It is evident that by the administering of concentrated (25 per cent) dextrose solutions the osmotic equilibrium of the system will be overturned, with a resulting absorption of inflammatory transudates and exudates. Intracranial pressure will be relieved by reducing brain volume, and since the meninges act as a diffusible membrane, spiral-cord edema will be relieved.

METHODS OF ADMINISTERING DEXTROSE

Dextrose solutions are absorbed readily from the gastric and intestinal mucosae, the peritoneal cavity and the subcutaneous and muscular tissues. The rates of absorption, in the order of their rapidity, are:

- | | |
|---------------------|---------------------|
| (1) Intravenous | (4) Subcutaneous |
| (2) Oral | (5) Intramuscular |
| (3) Intraperitoneal | (6) Rectal infusion |

The method of choice for the administration of dextrose will depend upon (1) the condition of the patient, (2) the therapeutic effect desired, and (3) the volume to be given.

Where concentrated solutions are indicated and where immediate effects are desired, the intravenous injection of a 25 to 50 per cent solution, given with a syringe, is the method of choice. Where the gastrointestinal tract is in good condition and the patient shows an inclination and ability to take and withhold fluids, the oral administration of dextrose in drinking water is of value. Subcutaneous administration of a dilute solution (5 to 10 per cent) in quantity by hypodermoclysis can be used but often an impaired circulation is unable to absorb properly the large quantity of fluid required. In our hands the intravenous administration of quantities ranging from 200 to 500 cc of 5 to 10 per cent solutions of dextrose are most satisfactorily administered by phleboclysis, using the Murphy drip method which essentially consists of a flask to which is attached a drip meter and regulating clamp. In this way the solution can be intro-

*3% is hypotonic; 5% is isotonic; 6% or over is hypertonic.

duced drop by drop. By taking into consideration the concentration of the solution plus the weight of the patient, the proper rate of infusion can easily be computed.

Sansman and Wilder have shown that the dextrose tolerance approximates 0.8 grams per kilo of body weight per hour, which is equivalent to 300 cc of a 5 per cent dextrose solution per hour for a 40-lb. dog. The figures of Sansman and Wilder, however, do not take into consideration the increased dextrose tolerance that occurs with prolonged dextrose therapy. This is probably the result of pancreatic stimulation by dextrose. Subcutaneous injections are usually made in the area immediately anterior to the shoulders. For phleboclysis the radial and saphenous veins are the ones most commonly used.

VEHICLE VALUE

One of the really outstanding advantages of using dextrose phleboclysis is the possibility of using the solution as a vehicle for other therapeutic substances. Immune serums can be given in large doses with less likelihood of shock. Poison antidotes such as sodium thiosulfate can be administered in large doses when diluted with dextrose solution and permitted to enter the circulation drop by drop. Emergency circulatory stimulation, such as by adrenalin, can be administered readily by merely injecting the solution into the rubber tubing. The same is true of practically all other types of drugs that are suitable for intravenous administration as very few are incompatible with dextrose solution.

The temperature of the solution can vary widely according to the desired effect. Heated solutions (around 110° F.) tend to raise body temperatures. They are therefore of value in all conditions of subnormal temperature. Solutions at room temperature have a beneficial effect in cases of high fevers.

STERILIZING THE DEXTROSE SOLUTION

Ten per cent solutions of chemically pure dextrose in distilled water are bottled and then autoclaved at 16 pounds pressure for 30 minutes. Excessive heat in sterilization should be guarded against to prevent caramelization.

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AIR VIEW OF COLUMBUS CIVIC CENTER

STUDIES ON THE EGG-PROPAGATED VIRUSES OF INFECTIOUS LARYNGOTRACHEITIS AND FOWL-POX*

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The use of the developing hen's egg as a medium for the *in vivo* propagation of various so-called filtrable viruses recently has yielded much information of interest and value. Among the virus disease agents of domestic fowl found infective for and cultivable upon the chicken embryo or its membranes are those of: Rous sarcoma (Rous and Peyton¹); fowl-pox (Woodruff and Goodpasture²); New Castle disease (Burnet and Ferry³); fowl plague (Burnet and Ferry³), and infectious laryngotracheitis (Burnet,⁴ Brandly^{5,6}).

The method of egg-propagation of the viruses has several advantages in that (1) it allows certain fundamental studies of pathogenesis, pathology and immunity; (2) it provides a means of securing relatively large quantities of virus cultivated and maintained free of bacteria; and (3) it furnishes a medium for the differentiation of certain infections.

During the course of studies in our laboratory dealing with the propagation of laryngotracheitis and fowl-pox viruses upon the developing hen's egg, a number of observations and results were recorded on several phases of the problem. Some points which were deemed of sufficient interest and significance are included in this report.

METHOD AND MATERIALS

Source of virus and eggs: The viruses employed originated in field outbreaks of infectious laryngotracheitis and fowl-pox. Tracheal exudate virus of laryngotracheitis was freed of bacteria by Berkefeld (V or N) filtration. The fowl-pox virus was obtained in bacteria-free form by excising aseptically the deeper portions of early fowl-pox lesions of the skin according to the method of Woodruff and Goodpasture.² The pox lesion material was ground finely in a sterile mortar and suspended in buffered nutrient broth. Fertile eggs from flocks of healthy Rhode Island Red and White Leghorn hens were used. The white-shelled Leghorn eggs were found preferable for the work because they allowed better passage of light for transillumination, thus facili-

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tating examination for lesions of the extra-embryonic tissues and viability of the embryo.

Method of inoculation: For routine use in cultivating the viruses within the egg the method previously described (Brandly⁶) was largely employed. This method and a second one, to be described here, are modifications or adaptations of the methods of Woodruff and Goodpasture,² Goodpasture and Bud-dingh⁷ and Burnet,⁸ carried out as follows:

Fertile eggs that have been incubated for ten to 14 days and which show vigorous, active embryos are candled by means of a strong light to allow definition and marking of the air-sac. An abrasive dental disc adapted directly to an electric motor is employed to cut out a circular piece of shell (approx. 1.5 cm in diameter) immediately over and just above the lower limit of the air-sac. The area is swabbed with alcohol and the outer shell membrane and the piece of shell removed with a sclerotome. With the egg in a holder, large pole uppermost, the inoculum is introduced directly upon the chorio-allantoic membrane. Small-gauge glass syringes graduated in .01 cc and carrying a 22-gauge hypodermic needle are employed for inoculation. The point of the needle is introduced through the shell opening, bevel down, and maintained almost parallel to the inner shell membrane while passing through it. Immediately after the opening of the needle has passed beneath the inner shell membrane, its point is elevated slightly to raise the membrane, thus forming a secondary or artificial air-sac by separating the shell membrane and the chorio-allantois. With the needle in this position, the inoculum (from 0.01 to 0.2 cc) is slowly injected. A definite separation of these structures prior to injection is apparently not essential for the development of infection by the virus but, as pointed out by Burnet,⁸ more extensive involvement usually results than without this step. After inoculation, the shell opening is closed with discs of colorless cellophane applied with library paste or with transparent cellulose tape. The inoculated egg is then returned for further incubation.

To allow direct observation of the development of lesions and to check closely upon the continued viability of the embryo a second method of preparing the egg for inoculation has been developed. The shell is cut through on a line 3 mm above and directly parallel to the lower limit of the air-sac. After swabbing with alcohol, the disc of shell and the outer shell membrane over the air-sac are removed and inoculation is effected in a manner identical with the first method. Then, a drop of sterile, light mineral oil is placed upon the inner shell membrane to render it

transparent. By the addition of the proper quantity of oil the shell membrane of the entire large pole may be treated without significant hazard to the viability of the embryo. Thus, the embryo and intervening structures are rendered clearly visible. The use of two strips of cellulose tape of proper length and width allows easy and complete sealing of the large opening of the shell, so that it may be incubated in the usual manner and observed at frequent intervals.

In eggs prepared and inoculated by the first method the development of dull or dark areas, as detected by observation through the cellophane window as it is held before a strong light, is indicative of the development of an infective process. In the case of the oil-treated membranes, the development of definite grayish foci, and later irregular areas or somewhat typical plaques may be observed either macroscopically or with the aid of a dissection microscope. Examination for early lesions may be facilitated by removing the cellulose tape cover which may be readily replaced upon completing the observations. Death of the embryo is indicated by loss of motility, general graying or darkening of the membranes and egg contents, and a disappearance of the visible blood-vessels.

EFFECT OF EGG-PROPAGATION UPON THE INFECTIVITY OF THE VIRUSES OF LARYNGOTRACHEITIS AND FOWL-POX

An investigation was made of the possibility that egg passage of these viruses had altered the infectivity for the embryo and its tissues as well as for the chicken. At the outset, the contemplated use of egg-cultivated viruses for protective vaccination necessitated such a study.

It was previously found (Brandly⁶) that the infective capacity of a strain of laryngotracheitis virus (8090) passed through 25 successive series of eggs was not altered significantly for the chicken. One strain (8090) was infective for chickens in 10^{-5} dilutions both before egg-passage and after 25 egg-passages. For the chorio-allantoic tissues the potency appeared to be significantly greater after the seventh passage as compared to the third passage but, thereafter, remained almost constant through the 25th egg-passage.

Subsequent tests on this strain of laryngotracheitis virus, passed through 35 egg generations, have shown no appreciable alteration or modification in infectivity for the developing egg or young chicken. Drying the 33rd egg-passage virus *in vacuo* in a frozen state for one month was not shown to have modified

its infective potency for eggs. The virulence for the cloacal tissue generally appeared to be somewhat lower than for the tracheal mucosa.

A strain of fowl-pox virus that had been carried through the second egg-passage produced infection of the skin of chickens in 10^{-5} dilution comparable to 10^{-4} dilution prior to egg-passage. Subsequent egg-cultivation through the eighth egg generation did not seem to reduce or enhance the infectivity for the chicken although an increased infectivity for eggs was manifested.

Similar variations were previously encountered and noted in the case of laryngotracheitis virus (Brandly⁶) and may be due to the factors of expected variation in trituration, dilution and inoculation.

THE EFFECT OF VARIOUS SOLUTIONS EMPLOYED AS VEHICLES

Tests were conducted with a number of solutions employed for suspending certain viruses and bacteria used to inoculate developing eggs. In this connection the influence of the vehicle upon the virulence and viability of the infective agent as well as upon the embryo and extra-embryonic tissues are important considerations.

Sterile nutrient broth of different pH values, 6.8, 7.0, 7.4, and 7.8, was injected in quantities of 0.1 and 0.2 cc into four series of four eggs each. No lesions or mortality resulted from the broth injections. Subsequently, several trials were made, using two lots of egg-propagated laryngotracheitis virus (21st to 23rd egg-passage) suspended in broth of the different pH values. In these tests the virus suspensions with the higher pH values, 7.4 and 7.8, gave a slightly higher incidence of infection and earlier embryo mortality with somewhat more extensive and heavier lesions.

The inoculations were made within two hours after suspending the virus. In the meantime, the suspensions had been held at 5° C. In view of other results (Brandly and Bushnell,⁹ Schalm and Beach¹⁰), the virulence and viability of the virus employed should not have been altered appreciably before inoculation by contact with broth of this pH range under the conditions of time and temperature prevailing. The possibility that the media of higher pH values in some way lowered the resistance of the tissues to invasion by the virus is suggested, but no evidence has been encountered to explain the variations observed.

Since glycerol solutions are widely used as preservatives and vehicles for the filtrable viruses, the effect of different concentrations of this agent was investigated. The glycerol-broth solu-

tions were prepared by adding a high-grade sterile glycerin (chemical reagent, Mallinckrodt) to buffered nutrient broth (pH 7.32). The pH determinations of the glycerol broth were made electrometrically 15 hours after mixture of the reagents. The virus suspensions employed were prepared immediately after the pH values were determined and inoculations carried out within one-half hour. Five eggs were injected with 0.1 cc and five with 0.05 cc each, of each preparation. The results are recorded in table I.

TABLE I—Results from egg inoculation of glycerol broth and broth with and without virus.

MEDIUM	pH	VIRUS	CHICKS HATCHED (%)	AVERAGE SURVIVAL TIME OF EMBRYOS SUCCUMBING (DAYS)	EXTENT OF LARYNGO- TRACHEITIS LESIONS
Broth	7.32	None	90.0	10.0	—
50% glycerol broth	6.0		—	2.0	—
25% glycerol broth	6.27		40.0	7.0	—
20% glycerol broth	6.3		80.0	9.0	—
10% glycerol broth	6.35		70.0	9.0	—
5% glycerol broth	6.4		80.0	9.0	—
Broth	7.32	1:100 dilution	—	5.5	3+
25% glycerol broth	6.2		—	6.5	3+
20% glycerol broth	6.3		—	7.0	3+
10% glycerol broth	6.35		—	5.5	3+

3+ = extensive, moderately heavy lesions of the chorio-allantois.

The results secured with glycerol solution showed that 0.1 cc of the 25 per cent glycerol broth was the maximum quantity which could be injected upon the chorio-allantois of 10-day eggs without directly causing serious injury and death of a majority of the embryos. On gross examination the embryos dying early after injection with solutions containing 25 per cent or more of glycerin showed slight to moderate edema and congestion of the chorio-allantoic membrane and marked generalized congestion of the embryo. When broth alone was used to suspend the laryngo-tracheitis virus for egg inoculation, the results were similar to those obtained by employing 5, 10 and 20 per cent glycerol broth as a vehicle, although greater irregularities were noted with the glycerol-suspended virus in the extent and nature of the lesions produced and in the time required to kill the embryos.

SUSCEPTIBILITY OF THE DEVELOPING EGGS OF OTHER SPECIES TO LARYNGOTRACHEITIS

Certain virus infections from alien species (man, equine, bovine), although slightly or not at all infective for mature chicken cells, find the embryonic chick tissues a favorable medium for invasion and proliferation. Therefore, it might be expected that virus infections of other species of birds would attack the chick embryo and its tissues, and *vice versa*. Infectious laryngotracheitis seems to attack naturally only chickens, pheasants and chicken-pheasant hybrids. With the object of determining if this apparently marked species specificity would maintain in the embryo, the developing eggs of the chicken, duck, guinea fowl, pigeon and turkey were inoculated with chicken egg-propagated laryngotracheitis virus. In one experiment, virus passed through 28 series of eggs was used for inoculating eggs from the above-mentioned species that had been incubated for ten days. In the other experiment the eggs had been incubated for twelve days before being inoculated with virus of the 31st series of chicken egg-passages. The virus tested on chickens three to five weeks old was infective when administered intratracheally in quantities of 0.05 cc or less of a 10^{-5} dilution. A 10^{-2} dilution in 0.05-cc dosages was used for all the egg inoculations. The results of these experiments are recorded in table II.

TABLE II—*Effect of inoculating laryngotracheitis virus into developing eggs of several species of birds.*

SPECIES OF EGGS	EGGS INOCULATED	EGGS TYPICALLY INFECTED	AVERAGE SURVIVAL TIME OF INFECTED EMBRYOS (DAYS)	AVERAGE EXTENT OF LESIONS
Chicken	57	43	5.8	3+
Duck	18	—	—	—
Guinea fowl	18	—	—	—
Pigeon	8	—	—	—
Turkey	16	13	8.2	3+

The infectivity of the virus for turkey and chicken eggs was proved by the gross and histologic appearance of the lesions and by the capacity of lesion material to infect susceptible chickens and developing eggs. As shown, all the chicken and turkey eggs did not become infected.

Some eggs of the other species under study manifested changes (drying, thickening, keratinization) of the chorio-allantoic membrane suspected of being due to laryngotracheitis. However, in

no case were these suspected tissues found capable of reproducing the infection when injected into developing chicken eggs. Similar grayish discoloration and keratinization had been observed in the chorio-allantoic membranes of some of the chicken eggs that failed to develop infection. Dawson¹¹ ascribed such changes in non-infected eggs largely to trauma inflicted during inoculation.

With few exceptions the laryngotracheitis lesions of the chorio-allantois of the turkey eggs were lighter in color and much drier than the lesions in the chicken eggs. A tendency of the dry turkey egg lesion to separate in desquamatory fashion was observed. The lighter color of the lesion appeared to be associated with the natural character of the egg membranes, while the lesser degree of edema in the specimens observed and the desiccation incident to a longer period of incubation seemed to account in part for the dry, flaky lesion in the turkey eggs.

Following one turkey egg-passage, the virus was tested on chicken eggs and susceptible chickens. Significant changes in infectivity were not observed. Two turkeys, six weeks of age, were inoculated intratracheally with massive doses of the chorio-allantoic lesion material from turkey eggs. No respiratory or other symptoms of laryngotracheitis were observed during the subsequent period of ten days.

RESULTS WITH THE USE OF EGG-PROPAGATED LARYNGOTRACHEITIS AND FOWL-POX VIRUS FOR VACCINATION

The utilization of egg-cultivated virus for vaccination against smallpox by Goodpasture and Buddingh,^{12, 7} Godinko¹³ and others prompted investigation of the problem as it may be applicable to laryngotracheitis and fowl-pox.

In preliminary experiments,⁶ egg-propagated laryngotracheitis virus gave results equally as good as those obtained with fresh tracheal virus. These laboratory experiments were supplemented with further experimental flock and field vaccinations embracing the use of fowl-pox as well as laryngotracheitis virus.

To guard against significant loss of potency before use, all laryngotracheitis virus both egg-grown and tracheal, if not to be used immediately, was frozen and dried in a partial vacuum over calcium chloride. The virus in the form of lesions in the unground chorio-allantoic membrane seemed to withstand any significant loss of virulence for at least ten days when frozen without supplementary desiccation.

One and ten per cent suspensions of virus were employed. The percentage and extent of "takes" were very similar. Inoculation by the cloacal method (Hudson and Beaudette¹⁴) was accomplished

TABLE III—Vaccination against laryngotracheitis with the egg-cultivated and tracheal virus.

EXPERIMENT	CHICKENS VACCINATED	AGE (WEEKS)	VIRUS SOURCE	TAKES				NEGATIVE	PERCENTAGE IMMUNE AFTER 3-4 WEEKS
				EXCELLENT	GOOD	FAIR	POOR		
1	50	5-6	Tracheal	6	13	18	6	5	82.0
	50	5-6	Egg	4	15	21	7	2	84.0
2	17	4	Tracheal	3	1	7	3	2	64.7
	20	4	Egg	4	5	5	2	3	75.0
3	35	8	Tracheal	0	7	21	4	3	82.8
	33	8	Egg	4	8	20	1	0	90.9
4	71	20	Tracheal	39	15	7	5	5	Not tested
	143	20	Egg	12	17	29	51	26	Not tested

The three birds in experiment 1 not included in the vaccination results died of intercurrent causes between the date of vaccination and the end of the period of observation for takes. One chick from each lot in experiment 2 died of laryngotracheitis at the sixth and seventh days after vaccination. Those individuals listed as reacting poorly or negatively to vaccination were re-vaccinated on the sixth day following original inoculation.

The 214 birds in experiment 4 were in a farm flock vaccinated during the month of August, 1935, and were not tested for immunity. Infection had existed on the premises during the previous two seasons but no cases of laryngotracheitis had been detected to date this year. Tests for immunity in the first three experiments were made by exposing the birds to intratracheal inoculation of egg virus (approximately 20 egg infective doses) 3-4 weeks after vaccination.

by brushing the cloacal mucosa (proctodaeum) lightly with a small, moderately stiff bristle brush dipped into the virus suspension. Examination for takes was carried out on the fourth and fifth days after vaccination and in several instances also on the sixth day. Depending upon the degree and extent of involvement of the cloacal mucosa, the takes were recorded according to the designations employed by Gibbs¹⁵ as excellent, good, fair and poor.

The results of the vaccination experiments are given in table III.

In vaccinating against fowl-pox, suspensions of fresh pox-affected chorio-allantoic membrane virus (3 to 8 egg-passages) and fresh dried comb-pox lesion virus were employed. For comparative purposes an attempt was made to use similar concentrations of each virus as determined by the relative numbers of Borrel bodies in the suspensions. For these determinations the lesion material was very finely triturated in the frozen state. Smears were made and stained by the method of Morosow.¹⁶ Twenty per cent glycerol broth was the vehicle and vaccination was done by the "stick" method, making two to four sticks on the breast below the wing. Readings for takes were made at the sixth and eighth days after vaccination. Tests for immunity after vaccination were carried out after 23 to 65 days by the stick method. Inoculations were made on the side opposite to the one used for vaccination. A potent suspension of comb-lesion virus was used to test for immunity in those birds vaccinated with egg-grown virus and a similarly potent egg-cultivated virus was used for testing the comb-lesion vaccinated individuals. The degree and extent of takes were recorded as with laryngotracheitis, namely, as excellent, good, fair and poor. The results are tabulated in table IV.

From the standpoint of takes and immunity, the results of these experiments indicate that the egg-propagated viruses of laryngotracheitis and fowl-pox may be substituted for the respective viruses obtained from the affected tissues of chickens. In the laboratory experiments with laryngotracheitis, the extent of takes and the degree of immunity were relatively low compared to reactions which are considered desirable. In the field flock the much lower efficiency of the egg-cultivated laryngotracheitis virus in producing takes was found upon investigation to be due to a marked deterioration in potency. This could be attributed largely to faulty desiccation during the period of six weeks that had elapsed from the time of collection of the virus

TABLE IV—Vaccination against fowl-pox with the comb and chorio-allantoic virus.

EXPERIMENT	CHICKENS VACCINATED	AGE (WEEKS)	VIRUS SOURCE	TAKES				NEGATIVE	IMMUNE ON TEST AFTER 25-65 DAYS	
				EXCELLENT	GOOD	FAIR	POOR		NUMBER	PER CENT
1	10	4	Comb lesion CA lesion	5	4	1	0	0	10	100.0
	12	4		8	3	0	1	0	11 ¹	100.0
2	15	10	Comb lesion CA lesion	6	4	2	1	1	14	83.3
	15	10		11	3	1	0	0	15	100.0
3	252	4	CA lesion CA lesion CA lesion CA lesion Comb lesion	223	22	0	0	1	245 ²	99.1
	209	6		198	6	3	0	0	205 ³	99.0
	263	8		252	9	0	0	2	257 ⁴	98.8
	247	10		239	7	0	0	1	240 ⁵	99.8
	63	10		24	27	3	7	2	59 ⁶	91.5
4	214	20	CA lesion	101	89	2	1	1	Not tested	

CA = chorio-allantoic membrane.

Immunity test results computed on basis of negative birds tested. ¹One bird died of intercurrent causes before immunity test. ²Five birds missing from this lot at time of test. ³Two birds missing. ⁴Seven dead or missing. ⁵Six dead or missing. ⁶Four missing.

until use for vaccination. According to Gibbs,¹⁵ the factor of age at the time of vaccination is an important one insofar as the development of a high percentage of takes and of a satisfactory immunity is concerned. The lack of facilities for properly handling and isolating older birds precluded the use of more nearly mature chickens in the laboratory experiments.

DISCUSSION

In our experience the first method of chorio-allantoic inoculation here described has been found to have some advantages over certain others. Bacterial contamination encountered during inoculation and incubation of a considerable number of eggs (1,100) was less than 5 per cent. The technic is simple and rapid. Compared to the practice of removing both the shell membranes before inoculation, the method here outlined results in less mechanical injury and alteration of the chorio-allantoic membrane and the production of more uniform and typical lesions. The second method, as compared to the cover-slip method (Goodpasture and Buddingh), in our hands has materially reduced the incidence of extraneous contamination and it allows observation and study of changes which develop over a larger area. However, in the inoculation of eggs incubated for periods of eleven days or less, the first method in several instances has yielded a somewhat lower percentage of infection than that of Goodpasture and Buddingh, where the position of the embryo is marked and the window for inoculation is made in the side of the egg not over the air-sac.

The passage of the strain of laryngotracheitis virus (8090) through 35 series of eggs did not cause apparent modification of its virulence for eggs or chickens. The titrations of infectivity, as determined by egg inoculation of dilutions of the ground chorio-allantoic lesion, would point to an apparent stabilization of potency. Goodpasture and Buddingh concluded that transfer of the egg-propagated virus of vaccinia during the early stage of the infective process is essential to maintain a uniformly high virulence. The general practice here employed, of removing the infected chorio-allantoic membrane only after death of the embryo, would perhaps yield different results than the routine use of 72- to 96-hour lesions. For this reason experiments to determine the relative potency of chorio-allantoic lesions of laryngotracheitis removed at different periods following inoculation would be desirable.

Similar studies with fowl-pox virus propagated upon the egg are likewise warranted.

The high sensitivity of the embryo and its tissues to various influences is emphasized by the observations regarding the effect of different solutions introduced upon the chorio-allantoic membrane of the egg. From this aspect alone the developing egg would seem to offer a very desirable subject for studies of the factors concerned with the mechanism of invasion and infection of the tissues.

The results of the tests on the susceptibility of developing eggs of certain species of birds other than chickens to laryngotracheitis may be interpreted as a further manifestation of the operation of an innate species character of resistance. At the same time there must not be overlooked the observation that a lack of fundamental differentiation may readily account for the great susceptibility of the embryonic tissue cells of a given species as compared to the relatively low or entire lack of susceptibility of the cells of the mature individual. That differentiation between certain virus infections may be accomplished on the basis of their infectivity for the developing eggs of various species of birds is suggested as a possibility incident to further studies.

Although a relatively small number of chickens were included in the vaccination experiments, the egg-propagated viruses of laryngotracheitis and of fowl-pox would appear to be desirable and satisfactory substitutes for the respective viruses obtained from mature fowl. The percentage of "takes" following vaccination against laryngotracheitis with one exception was higher with the egg-propagated than with the tracheal virus. It would appear that the degree of immunity induced with virus from either source, as judged by susceptibility to tracheal inoculations, was not always satisfactory. However, some observations made in this laboratory suggest that certain vaccinated individuals are at times apparently immune to exposure by contact with sick birds but not to tracheal inoculation with measurably small quantities of virus. In the use of chorio-allantoic-propagated viruses of laryngotracheitis and fowl-pox for vaccination, only material possessing a high degree of infectivity for the susceptible tissues of the fowl as well as for the egg should be employed.

SUMMARY AND CONCLUSIONS

1. The viruses of infectious laryngotracheitis and of fowl-pox may be carried through an indefinite series of developing egg-passages by the methods here described. The incidence of extraneous bacterial contamination was materially lower than with the methods described by others.

2. Infectious laryngotracheitis virus (strain 8090), propagated through 35 series of developing chicken eggs, did not show significant modifications in virulence. The egg-propagated virus appeared equally as satisfactory as fresh tracheal exudate virus when used for protective vaccination against the disease.

3. Fowl-pox virus passed through eight series of chicken eggs did not appear to be altered significantly in virulence for developing eggs or chickens of several ages. The chorio-allantoic-cultivated pox virus used in vaccination gave satisfactory "takes" and immunity as compared to the comb-lesion virus from nearly mature chickens.

4. Of the species of developing eggs, other than chickens, only those of the turkey were susceptible to infectious laryngotracheitis infection. By the methods employed, negative results were obtained with pigeon, guinea fowl and duck eggs.

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LYMPHOCYTOMA AND FOWL PARALYSIS*

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During recent years, many research workers have become interested in studying a fatal neoplastic-like disease of the domestic fowl, the type cell of which is the undifferentiated lymphocyte. Some consider the pathological conditions as a single entity with complex symptoms. Others are of the opinion that the lesions confined to the eyes, nerve and brain tissues constitute a separate and distinct condition from that which involves the visceral organs and the skeletal muscles. The author has chosen the term "lymphocytoma" to designate that form of the disease in which the pathological lesions are confined to the visceral organs and the skeletal muscles, and "fowl paralysis" to designate the condition in which the pathological lesions are confined to the eyes, nerve and brain tissues.

Several thousand dead birds are received at our diagnosis laboratory each year for autopsy purposes. Lymphocytoma was known to have existed for several years in a large nearby flock. Pedigree records were available for all birds in this flock. All dead birds were autopsied, and thus we had a record of the macroscopic lesions. Histopathological examinations were made of all organs and tissues that showed gross neoplastic changes. Nerve and brain tissues likewise were examined. Lymphocytoma was found to be the cause of death of many birds. Cellular infiltrations were not found in the peripheral nerves or brain tissues examined. This flock presented an excellent opportunity to study these conditions, both from a pathological and genetic viewpoint.

LITERATURE

A review of the literature is not included. Biely and Palmer¹ reviewed the literature pertaining to the etiology of fowl paralysis. The literature relating to lymphocytoma was reviewed by Johnson.² Recent contributions are available to those desiring the same.

When this project was outlined, it was arranged so that data could be obtained with reference to several phases of the disease which were thought to be of scientific interest. The genetic factors were of paramount interest. Several types of matings

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were made. We desired to know whether or not it was possible to rear offspring from certain selected matings that would be resistant to lymphocytoma. It was also desirable to obtain additional data with reference to the incidence of the disease as it affected the various organs and tissues, the latter to be determined by gross and histopathological examinations. White Leghorns were used in the experiment.

The data included in this report were obtained during a two-year period, from March, 1933, to July, 1935. All birds used in the experiment were tested by the rapid whole-blood agglutination test for pullorum disease and all were found to be negative, with one exception (bird 97).

PROCEDURE

Two types of matings were made: (1) A potentially lymphocytoma male was crossed with potentially lymphocytoma females. (2) A potentially lymphocytoma male was crossed with apparently non-lymphocytoma females. These birds were all one year old and their selection was based on the incidence of the disease as it developed or did not develop among their brothers and sisters.

Group 1, the potentially lymphocytoma females, had the following familial incidence of the disease with respect to their brothers and sisters:

Two females with	3 out of 5
One female with	2 out of 4
Three females with	2 out of 7
One female with	1 out of 5
One female with	2 out of 9
Two females with	1 out of 8
One female with	2 out of 6

Group 2, the apparently non-lymphocytoma females, had the following history of lymphocytoma with reference to their brothers and sisters:

One female with	0 out of 7
Two females with	0 out of 5
One female with	0 out of 4
One female with	0 out of 1

The two groups were mated with one cockerel. Two out of four of his brothers and sisters died as a result of lymphocytoma.

All parent stock was wing- and leg-banded and accurate hatching records obtained. Laying hens were trap-nested and the chicks hatched were pedigreed. The data contain the results of the blood examinations, the final disposition of the bird and, if death occurred, the cause if determined. If pathological lesions were found, the record indicated the organs and structures involved. Sections were taken for microscopic examination from

all organs that showed neoplastic changes. Sections for histopathological examination were taken from the femoral nerves and brain.

Our former consistently negative results,^{3,4} when attempts were made to transmit lymphocytoma by using inocula obtained from the diseased tissues of birds, were so definite that we did not attempt any transmission experiments with this disease.

Several attempts were made to transmit fowl paralysis to supposedly susceptible birds. The inoculum contained portions of femoral nerves, spinal cord and brain suspended in a physiological saline solution. The material was ground in a sterile mortar, after which the coarser particles were removed by filtration through a thin layer of sterile cotton and gauze. The inoculum was injected intravenously.

Tables I and II give significant data obtained from March 14, 1933, to July 1, 1934.

TABLE I—Data on groups 1 and 2, March 14, 1933, to July 1, 1934.

GROUP	DAM (P 1)	EGGS PRODUCED	INFERTILE EGGS	EMBRYOS DEAD IN SHELL	CHICKS HATCHED (F 1)
1	B 70	42	2	11	29
	B 71	53	5	17	31
	B 80	25	6	6	13
	B 90	0	0	0	0
	B 93	14	1	5	8
	B 94	31	13	7	11
	B 97	10	1	5	4
	B 105	18	13	2	3
	B 130	16	2	7	7
	B 131	48	10	15	23
	B 146	23	8	8	7
	Totals	280	61	83	136
2	B 113	49	6	15	28
	B 134	35	6	11	18
	B 137	36	2	11	23
	B 150	47	11	9	27
	B 191	2	2	0	0
	Totals	169	27	46	96

Hatchability for group 1 was 48 per cent and for group 2, 56 per cent.

The distribution of lesions, both microscopic and macroscopic, is of special interest.

Lymphocytoma was found to be the cause of death of four birds, while 22 died as a result of fowl paralysis. Table III gives

TABLE II—Additional data on groups 1 and 2.

GROUP	DAM (P 1)	INCIDENCE OF LYMPHOCYTOMA IN FAMILY OF DAM	CHICKS HATCHED (F 1)	DIED AS RESULT OF INTERCURRENT DISEASES	DIED AS RESULT OF LYMPHOCYTOMA	DIED AS RESULT OF FOWL PARALYSIS	STATUS OF DAM AT END OF YEAR, JULY 1, 1934
1	B 70	3 of 5	29	13	1	0	Living
	B 71	3 of 5	31	16	0	7	Living
	B 80	2 of 4	13	9	2	2	D. Cause undetermined
	B 90	2 of 7	0	0	0	0	D. Lymphocytoma
	B 93	2 of 7	8	6	1	0	Living
	B 94	2 of 7	11	4	0	1	D. Peritonitis
	B 97	1 of 5	4	4	0	0	D. Pullorum disease
	B 105	2 of 9	3	1	0	1	D. Fowl paralysis
	B 130	1 of 8	7	5	0	1	D. Peritonitis
	B 131	1 of 8	23	15	0	2	D. Lymphocytoma
	B 146	2 of 6	7	6	0	0	D. Fowl paralysis
	Totals		136	79	4	14	
2	B 113	0 of 7	28	15	0	0	Living
	B 134	0 of 5	18	16	0	2	Living
	B 137	0 of 5	23	10	0	3	D. Lymphocytoma
	B 150	0 of 4	27	14	0	3	D. Abscess of gizzard
	B 191	0 of 1	0	0	0	0	D. Lymphocytoma
	Totals		96	55	0	8	

D. = dead.

TABLE III—Frequency of occurrence of lesions in the different organs of 26 birds.

LESIONS	HEART	LIVER	SPLEEN	KIDNEY	OVARY	TESTES	EYES	FEMORAL NERVES	SPINAL CORD	BRAIN
Macroscopic	4	4	3	5	2	0	0	6	0	0
Histopathologic	5	11	3	5	2	0	0	20	8	12

a list of the organs to which special attention was given and the frequency of occurrence of lesions of the diseases.

CONTROLS

Day-old chicks were purchased from a breeder who had a flock with a negative history as far as the diseases lymphocytoma and fowl paralysis were concerned. The parent stock of these chicks

had passed a negative whole-blood rapid agglutination test for pullorum disease. Twenty-one of these chicks were used as controls. When they were six weeks old, they were placed in the same pens with the experiment birds. Twenty additional controls of our own rearing were placed in the same pens with the experiment birds when six weeks old. Two of the first group of controls died as a result of lymphocytoma.

The second year of the experiment was continued nearly as before. Only four of the original group of females were living, the remainder having died as indicated in table II. However, it was now known that complications had begun to appear. The autopsy findings and the histopathological examinations indicated that four birds had died as a result of lymphocytoma and that 22 deaths were due to fowl paralysis. For example, bird B71, a potentially lymphocytoma female and still living, produced seven offspring that died as a result of fowl paralysis. Three groups (1, 2 and 3) were selected. Group 1 contained 18 females. Fourteen of them were potentially fowl paralysis females as determined by the familial incidence of that disease. Three were potentially lymphocytoma females, and one female whose familial history was negative with reference to both diseases. Group 2 contained twelve potentially fowl-paralysis females, eight potentially lymphocytoma females and eight females whose dam (B113) had a negative history with reference to both diseases

TABLE IV—Data on group 1.

DAMS (P1 AND F1)	EGGS PRODUCED	INFERTILE EGGS	EMBRYOS DEAD IN SHELL	CHICKS HATCHED (F2)
B70 (P1)	11	6	2	3
B71 (P1)	30	11	5	14
B93 (P1)	10	1	0	9
B134 (P1)	16	4	4	8
V33-122 (F1)	17	14	3	0
V33-175 (F1)	33	15	6	12
V33-178 (F1)	34	9	2	23
V33-253 (F1)	34	13	1	20
V33-68 (F1)	31	5	0	26
V33-198 (F1)	1	1	0	0
V33-13 (F1)	24	24	0	0
V33-15 (F1)	27	10	5	12
V33-16 (F1)	33	19	6	8
V33-51 (F1)	33	10	5	18
V33-81 (F1)	33	23	5	5
V33-87 (F1)	26	16	7	3
Totals	393	181	51	161

and none of the 18 of her offspring raised to maturity developed either of the diseases under discussion. Each group was mated with two cockerels that were full brothers, each being a potentially fowl-paralysis male produced by hen B71.

The birds of group 3 were selected from the stock used to rear controls the previous year and had a negative family history with reference to the two diseases.

These three groups (1, 2 and 3) were all first-generation birds with the exception of four individuals (B70, 71, 93 and 134). Eggs were collected for hatching purposes beginning March, 1934. Essential data are included in tables IV and IVa.

Hatchability of group 1 was 41 per cent and of group 2, 44 per cent. The low percentage of hatchability of the eggs pro-

TABLE IVa—Data on group 2.

DAM (F1)	EGGS PRODUCED	INFERTILE EGGS	EMBRYOS DEAD IN SHELL	CHICKS HATCHED (F2)
V33-25	38	13	5	20
V33-28	42	18	0	24
V33-31	6	3	1	2
V33-36	31	9	5	17
V33-40	15	11	1	3
V33-46	24	17	2	5
V33-47	32	11	10	11
V33-48	36	28	2	6
V33-85	38	6	11	21
V33-55	34	3	4	27
V33-58	41	15	2	24
V33-113	32	7	4	21
V33-74	31	24	5	2
V33-75	30	8	5	17
V33-76	38	9	2	27
V33-116	16	7	1	8
V33-138	31	13	10	8
V33-141	28	10	5	13
V33-151	31	13	8	10
V33-159	34	8	8	18
V33-162	36	14	4	18
V33-164	26	12	6	8
V33-167	26	7	0	19
V33-227	15	10	2	3
V33-229	29	10	5	14
V33-232	19	7	6	6
V33-239	9	0	4	5
V33-249	29	11	4	14
V33-61	18	16	1	1
V33-182	1	1	0	0
V33-237	1	1	0	0
V33-265	20	17	3	0
V33-18	1	1	0	0
Totals	838	340	126	372

TABLE V—Additional data on group 1.

P1 Leg-BAND	INCIDENCE OF LYMPHOCTOMA IN P1 FAMILY	F1 Leg-BAND	INCIDENCE OF LYMPHOCTOMA IN F1 FAMILY	INCIDENCE OF FOWL PARALYSIS IN F1 FAMILY	CHICKS HATCHED (F2)	INCIDENCE OF LYMPHOCTOMA IN F2	INCIDENCE OF FOWL PARALYSIS IN F2	DIED AS RESULT OF LYMPHOCTOMA (F2)	DIED AS RESULT OF FOWL PARALYSIS (F2)	DEATHS DUE TO INTERCURRENT DISEASES (F2)	STATUS OF DAM AT END OF YEAR, JULY 1, 1935
B70	3 of 5				3	0 of 3	0 of 3	0	0	3	D. Lymphocytoma
B71	3 of 5				14	4 of 12	2 of 12	4	2	4	Living
B93	2 of 7				9	0 of 7	2 of 7	0	2	4	Living
B134	0 of 5				8	0 of 3	1 of 3	0	1	6	Living
B71	3 of 5	175	0 of 19	7 of 19	12	0 of 6	0 of 6	0	0	10	D. Undetermined
B71	3 of 5	178	0 of 19	7 of 19	23	2 of 13	2 of 13	2	2	14	Sold
B71	3 of 5	253	0 of 19	7 of 19	20	1 of 12	0 of 12	1	0	12	Sold
B94	2 of 7	68	0 of 8	1 of 8	26	1 of 16	1 of 16	1	1	17	Sold
B137	0 of 5	15	0 of 16	3 of 16	12	0 of 6	1 of 6	0	1	9	Sold
B137	0 of 5	16	0 of 16	3 of 16	8	0 of 1	1 of 2	0	1	7	Sold
B137	0 of 5	51	0 of 16	3 of 16	18	0 of 10	0 of 10	0	0	10	Sold
B137	0 of 5	81	0 of 16	3 of 16	5	0 of 0	0 of 0	0	0	5	D. Overheated
B137	0 of 5	87	0 of 16	3 of 16	3	0 of 2	0 of 2	0	0	1	D. Lymphocytoma
Totals					161			8	10	102	

D. = dead.

PI Leg-Band	INCIDENCE OF LYMPHOCTOMA IN PI FAMILY	FI Leg-Band	INCIDENCE OF LYMPHOCTOMA IN FI FAMILY	INCIDENCE OF FOWL PARALYSIS IN FI FAMILY	CHICKS HATCHED (F2)	INCIDENCE OF LYMPHOCTOMA IN F2	INCIDENCE OF FOWL PARALYSIS IN F2	DIED AS RESULT OF LYMPHOCTOMA (F2)	DIED AS RESULT OF FOWL PARALYSIS (F2)	DEATHS DUE TO INTERCURRENT DISEASES (F2)	STATUS OF DAM AT END OF YEAR, JULY 1, 1935
B70	3 of 5	25	1 of 22	0 of 22	20	1 of 11	3 of 11	1	3	14	Sold
B131	1 of 8	28	0 of 10	2 of 10	24	1 of 9	2 of 9	1	2	22	D. Peritonitis
B131	1 of 8	31	0 of 10	2 of 10	2	0 of 0	0 of 0	0	0	1	D. Fowl paralysis
B113	0 of 7	36	0 of 18	0 of 18	17	1 of 8	1 of 8	1	1	10	Sold
B113	0 of 7	40	0 of 18	0 of 18	3	0 of 2	0 of 2	0	0	2	Sold
B150	0 of 4	46	0 of 20	3 of 20	5	0 of 2	0 of 2	0	0	4	Sold
B150	0 of 4	47	0 of 20	3 of 20	11	0 of 3	0 of 3	0	0	11	Sold
B150	0 of 4	48	0 of 20	3 of 20	6	0 of 2	0 of 2	0	0	4	Sold
B70	3 of 5	85	1 of 22	0 of 22	21	0 of 3	0 of 3	0	0	18	Sold
B70	3 of 5	55	1 of 22	0 of 22	27	0 of 16	0 of 16	0	0	14	Sold
B113	0 of 7	58	0 of 18	0 of 18	25	2 of 16	5 of 16	0	5	15	Sold
B113	0 of 7	113	0 of 18	0 of 18	21	0 of 9	0 of 9	0	0	13	Sold
B70	3 of 5	74	1 of 22	0 of 22	2	0 of 1	0 of 1	0	0	1	Sold
B70	3 of 5	75	1 of 22	0 of 22	17	0 of 5	0 of 5	0	0	15	Sold
B150	0 of 4	76	0 of 20	3 of 20	27	2 of 15	0 of 15	2	0	17	Living
B131	1 of 8	116	0 of 10	2 of 10	8	0 of 4	1 of 4	0	1	7	D. Tracheitis
B70	3 of 5	138	1 of 22	0 of 22	8	0 of 1	0 of 1	0	0	8	D. Peritonitis
B70	3 of 5	141	1 of 22	0 of 22	13	1 of 10	1 of 10	1	1	9	D. Lymphocytoma
B113	0 of 7	151	0 of 18	0 of 18	10	1 of 1	0 of 1	1	0	9	Sold
B131	1 of 8	159	0 of 10	2 of 10	18	1 of 5	0 of 5	1	0	16	Sold
B113	0 of 7	162	0 of 18	0 of 18	18	0 of 9	0 of 9	0	0	13	Sold
B113	0 of 7	164	0 of 18	0 of 18	8	1 of 4	0 of 4	1	0	5	Sold
B150	0 of 4	167	0 of 20	3 of 20	19	1 of 6	2 of 6	1	2	15	Sold
B70	3 of 5	227	1 of 22	0 of 22	3	0 of 1	0 of 1	0	0	2	Sold
B131	1 of 8	229	0 of 10	2 of 10	13	1 of 8	1 of 8	1	1	9	Living
B131	1 of 8	232	0 of 10	2 of 10	6	0 of 3	0 of 3	0	0	5	D. Enteritis
B130	1 of 8	239	0 of 4	1 of 4	5	0 of 3	1 of 3	0	1	4	D. Undetermined
B113	0 of 7	249	0 of 18	0 of 18	14	1 of 4	1 of 4	1	1	11	D. Peritonitis
B134	0 of 5	61	0 of 9	0 of 9	1	0 of 1	1 of 1	0	1	0	D. Anemia
Totals					372			14	19	274	

D. = dead.

duced by birds in this experiment may have been due to the limited space that it was possible to provide for the breeding stock during the hatching season.

Group 3, the control group, consisted of ten White Leghorn hens mated with one cockerel. This group of hens produced 269 eggs, 101 of these were infertile, 32 had dead embryos in the shell and 136 chicks were hatched. Hatchability was 50 per cent.

Tables V and Va contain further data on these groups.

Lymphocytoma has been noted as the cause of death of 22 birds, and 29 birds died as a result of fowl paralysis. Distribution of lesions was observed and recorded. Table VI gives a list of the organs to which special attention was given and the frequency of occurrence of lesions of the disease.

TABLE VI—*Frequency of occurrence of lesions in the different organs of 51 birds.*

LESIONS	HEART	LIVER	SPLEEN	KIDNEY	OVARY	TESTES	EYES	FEMORAL NERVES	SPINAL CORD	BRAIN
Macroscopic	4	18	4	10	5	0	2	16	0	0
Histopathologic	7	24	4	14	5	0	2	25	10	16

Lymphocytoma was the cause of death of seven of the control birds while one bird died as a result of fowl paralysis.

PATHOLOGY

The macroscopic and microscopic pathology of lymphocytoma has been described in a previous publication.⁴ Pappenheimer,⁵ Doyle,⁶ Johnson,² Patterson⁷ and others have published excellent descriptions of the gross appearance and microscopic lesions of the visceral organs, the nerves and brain tissue. There seems to be a general agreement that the neoplastic tissue is the result of an infiltration with a type cell considered to be an undifferentiated lymphocyte. Mitosis is frequently observed.

TRANSMISSION EXPERIMENTS

Negative results with one exception were obtained when attempts were made to transmit fowl paralysis to other birds. The inoculated birds were all approximately one year old.

A cockerel (V33-84) affected with fowl paralysis was destroyed, and portions of the brain, spinal cord and femoral nerves were removed. An inoculum was prepared by using portions of these tissues. Ten birds were injected with this inoculum as designated:

Each of four birds was injected with one to two minims intravenously, three received eight minims intraabdominally, and three were given eight minims intramuscularly. Negative results were obtained.

On April 13, 1934, a cockerel (V33-136) affected with fowl paralysis was destroyed. An inoculum was prepared as above. Nineteen birds served as recipients and were inoculated with amounts as designated: Ten birds were injected intramuscularly in the femoral region with eight minims each, three were injected intraabdominally with ten minims each, three were injected subcutaneously with four minims each, and three received eight minims by the intravenous method. Five and one-half months later, one bird died as a result of fowl paralysis. This latter bird had been inoculated intramuscularly in the femoral region. The birds that received the inoculum intravenously died either while being inoculated or very shortly thereafter.

On April 14, 1934, another cockerel (V33-128) affected with fowl paralysis was destroyed. An inoculum was prepared as before. Ten birds were inoculated intravenously each with five minims of the material. Five of the recipients died either immediately or within one or two minutes after the injection was completed. Negative results were obtained with the remaining five birds.

Immediately after the above fatalities occurred following intravenous injections, two birds were inoculated intravenously with 1.0 and 2.0 cc each of the physiological saline solution. No distress was observed.

BLOOD EXAMINATIONS

Regular monthly blood examinations begun at three to four months of age were made of all birds included in the experiment. These consisted of the microscopic study of blood smears stained with the Wright method. When pathological features were observed in any of the blood cells, a blood examination, total leukocyte and differential counts were made. For a comparative study the index cards of two groups of twelve birds each were selected at random. One group included birds that died as a result of lymphocytoma while the second group consisted of birds affected with fowl paralysis. The tabulated results of these two groups were compared with those of normal birds previously reported.³ Averages were used as a basis of comparison. The blood of the birds affected with lymphocytoma showed a slight erythropenia with a moderate leukocytosis in comparison to that of normal birds.³ The hemoglobin content

(Dare's method) of birds affected with fowl paralysis was found to be slightly higher than that of birds affected with lymphocytoma or that of normal birds. None of the variations noted were significant.

BACTERIOLOGICAL EXAMINATIONS

The vital organs of all birds that died were cultured. The media used were beef nutrient agar enriched with 10 per cent horse serum, and plain beef broth. Cultures were incubated at 37.5°C. for 48 hours. If no growth developed at the end of this period of incubation, they were considered as sterile. *P. avisepticus*, *P. avicida* and *S. pullorum* were recovered by this method in a few instances.

DISCUSSION

It was realized in the beginning that many difficulties would be encountered. It was impossible to rear and otherwise handle the birds without exposing them to other diseases. Losses as a result of intercurrent diseases were tremendous. An examination of tables II, V and Va shows that nearly 58 per cent of the chicks hatched during the first year and that 70 per cent of those hatched during the second year died as a result of conditions other than those under investigation. In order to continue the second year, it was necessary to include all the surviving females. Apparently healthy cockerels, except those used for breeding purposes, were sold at the end of each year.

Lymphocytoma and fowl paralysis did not develop in any instance among the birds less than approximately six months of age. This is an arbitrary age and it is recognized that younger birds are susceptible.

An examination of tables II, V and Va will reveal some interesting data. A potentially lymphocytoma female (B71) included in group 1 of table II produced 53 eggs from which 31 chicks were hatched. Seven of the latter that were reared beyond six months of age died as a result of fowl paralysis. This hen was placed in group 1 of table V the following year. Four of her offspring died as a result of lymphocytoma and two others as a result of fowl paralysis. Three daughters (F1) of B71 were also members of this group. Three of their offspring (F2) died as a result of lymphocytoma and two others (F2) as a result of fowl paralysis. Nearly all of this F2 group proved susceptible to intercurrent diseases. The hen (B71) was still alive at the end of the experiment.

Fowl paralysis was the cause of death of eight birds belonging to group 2 of table II (the potentially non-lymphocytoma group).

Lymphocytoma did not develop among the birds in this group. A hen (B113) belonging to the above group produced 49 eggs during the first year from which 28 chicks were hatched. None of the latter that were reared developed either of the two diseases under discussion. Group 2 of table Va contained, with others, eight F1 females of B113 the second year. Fowl paralysis and lymphocytoma did develop among the F2 birds of B113.

It was stated before that the parent stock was obtained from a flock where lymphocytoma was continually exacting a heavy toll. This condition is continuing at the present time. It was only during the last year that an occasional bird developed fowl paralysis. It is our opinion that the virus of fowl paralysis was introduced into our birds from outside sources. The opportunity is ever present because several hundred birds are autopsied annually that are affected with the disease. It is no longer impossible to transmit fowl paralysis by experimental methods but so far as the literature has been observed, no one has been able to devise a successful means of transmitting lymphocytoma by means of experimental methods. Our belief that lymphocytoma is a specific disease characterized by the occurrence of pinkish-gray to grayish-white diffuse masses or nodules of undifferentiated lymphocytic cells distributed in the abdominal viscera and skeletal muscles concurs with those of Feldman and Olson⁸ and others. Our findings with reference to fowl paralysis being a specific disease is in accord with Doyle,⁶ Pappenheimer,⁵ Beaudette and Hudson⁹ and Seagar.¹⁰ No support can be given with our data to the findings of Patterson⁷ and his co-workers or those of Emmel.¹¹

The data showing the macroscopic and microscopic changes as they were found in the various organs and tissues have not been included. A general summary of the distribution of such lesions is found in tables III and VI. These unpublished data further support our contention that the virus of fowl paralysis is specifically neurotropic while that of lymphocytoma affects the visceral organs and skeletal muscles. Only two birds, both cockerels, showed evidence of iritis. Both of these birds were affected with fowl paralysis.

The records of our diagnosis laboratory contain a great deal of unpublished data. Many birds are received for autopsy purposes that are totally blind as a result of fowl paralysis becoming localized in the iris as well as other nerve or brain tissue. A bird may also be totally blind as a result of iritis and show no signs of lameness. Histopathologically, the eye lesions are in-

distinguishable from those in which the iris, nerve and brain tissue are affected. An equally large number of non-paralyzed birds are autopsied annually that show only macroscopic changes involving the visceral organs or skeletal muscles. Histopathological examination of serial sections of nerve and brain tissue of such birds has been carried out. Cellular infiltration of nerve and brain tissue was not found.

A very much smaller number of birds also are autopsied that are blind in one or both eyes, paralyzed and also show clinical evidence of lymphocytoma. Macroscopic changes indicative of both diseases may be found when such birds are autopsied. Histopathological examination usually confirms the macroscopic changes. Such findings are considered evidence of the presence of both diseases in the same individual.

Hypertrophic osteoperiostitis described by Jungherr¹² was not found affecting the experiment birds. Only a very few birds are received for diagnostic purposes that are affected with hypertrophic osteoperiostitis. We do receive a large number of wing and leg bones that show the characteristic changes of this condition. Such specimens were found after the carcass was prepared for table use. The presence of this disease in an appreciable number of a flock has not been observed.

SUMMARY

1. A total of 715 chicks were hatched during the two-year-period.
2. Losses due to intercurrent diseases were tremendous. Fifty-eight per cent of the chicks hatched during the first year and 70 per cent of those hatched during the second year died as a result of other diseases than those under investigation.
3. It is believed that the virus of fowl paralysis was introduced from outside sources.
4. These data and the records of our diagnosis laboratory support the belief that lymphocytoma and fowl paralysis are two separate diseases, the latter being transmissible while the former is non-transmissible. Furthermore, the two diseases may co-exist in the same bird.
5. These data suggest that heredity is a factor to be considered in the transmission of lymphocytoma and fowl paralysis.

ACKNOWLEDGMENTS

Dr. F. B. Hutt, Professor of Animal Genetics, was a member of the staff at this University when this experiment was begun. Before the experiment was completed and the data were arranged,

Dr. Hutt accepted a similar position at Cornell University, Ithaca, New York. The author wishes to express his gratitude to Dr. Hutt for the assistance given in selecting the breeding birds used in the experiment. It is regretted that the genetic factors that may or may not have been involved in this study are not included more comprehensively.

The writer wishes to express his appreciation to Hazel Hamersland for much of the technical assistance in connection with the study.

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PERSONALS

DR. FRED S. MOLT (Ind. '12), of Hinton, Okla., is a breeder of registered Jersey cattle.

DR. J. L. TOPMILLER (McK. '05), of Bowling Green, Ky., has been selected as official veterinarian for the Warren County Fair, to be held September 2-5, 1936.

DR. G. E. BOTKIN (Ind. '12), of Marion, Ind., was elected chairman of the Grant County Republican Central Committee, at a meeting held in Marion on March 7.

**73rd Annual Convention A. V. M. A.
Columbus, Ohio, August 11-12-13-14**

A SURVEY OF THE INCIDENCE OF BRUCELLA IN PASTEURIZED AND UNPASTEURIZED MARKET MILK IN ILLINOIS*

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FOREWORD

The rather wide dissemination of *Brucella abortus* in milk supplies has been demonstrated. That this organism may cause undulant fever in humans is generally accepted as a fact. The prevalence of recognized undulant fever has increased steadily in Illinois and in the United States during the last decade. There are now reported in Illinois about 100 new cases annually against half a dozen ten years ago. In the United States about 4,000 new cases are reported annually. It may be that the disease is on a general upward trend which, if unchecked, may assume major importance as a public health problem. Such has been the history of various communicable diseases, of which leprosy and tuberculosis are good examples.

A few epidemic outbreaks of undulant fever have been definitely attributed to contaminated milk supplies. Presumptive evidence that contaminated milk is one of the principal channels through which undulant fever reaches humans has been produced. It appears, moreover, that *Brucella abortus* is less easily destroyed by the application of heat than are such organisms as the tubercle and typhoid fever bacilli.

For these reasons research activities bearing upon methods of detecting and destroying the virulence of *Brucella abortus* in milk are of no little importance from the public health point of view. I consider this report of the studies made at the University of Illinois as an important contribution toward the control of undulant fever.—FRANK J. JIRKA, M. D., Director, Illinois State Department of Public Health.

Probably no group of microorganisms in recent years has been given a greater amount of attention by bacteriologists, public health officials, physicians and veterinarians in all parts of the world than the *Brucella* group. Literature is overflowing with reports on *Brucella* spp. in their varied rôles, together with suggested means of suppression and control.

The original reports by Schroeder and Cotton¹ and Smith and Fabyan² and the subsequent studies on the occurrence of *Brucella* in cows' milk and on heat resistance, however, have been concerned chiefly with the incidence of the microorganisms in raw milk from reacting and nonreacting cows and with pasteurization of milk under laboratory conditions or in a limited num-

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ber of commercial pasteurizers. Comparatively few investigators, however, have studied the incidence of *Brucella* before and after pasteurization in more than one or two pasteurization plants.

HISTORICAL

Table I summarizes, in condensed form, all the available reports of investigations of the heat resistance of the three types of *Brucella*. An examination of this table will show that there is a slight difference in the results secured by various investigators, although the general trend of opinion appears to be that pasteurization of milk at 142° F. for 30 minutes will kill all types of *Brucella*. The reports which do not agree with this opinion were evidently concerned with larger numbers of micro-organisms than would ordinarily occur in market milk, or were conducted under poor pasteurization conditions.

In a preliminary report³ from the Illinois Agricultural Experiment Station, the results of heating sealed and cotton-stoppered tubes of milk artificially infected with two strains of *Brucella suis* in the range of pasteurization temperatures suggested that the number of *Brucella* in milk influenced the thermal death time. Two strains of *Br. suis* (500,000,000 organisms per cc) were non-viable after 20 minutes at 140° F., after 15 minutes at 142° F., and after 7 minutes at 144° F., in sealed tubes. The same strains proved more resistant to heat in cotton-stoppered tubes of milk although this technic is regarded as questionable. *Br. suis* survived for 30 minutes at 144° F. in milk containing 10,000,000 to 500,000,000 organisms per cc, but in the same period of time the same temperature destroyed *Br. suis* in milk containing 5,000 to 1,000,000 organisms per cc.

As *Brucella* in milk from the udder of naturally infected cows fall below the range of the artificially contaminated samples employed in preliminary experiments, attention was directed to market milk with the view of appraising the efficiency of pasteurization in destroying *Brucella* as employed at milk depots in Illinois. The results to be reported at this time concern samples of pasteurized and unpasteurized milk obtained from commercial pasteurization plants in different towns in Illinois.

Pasteurizers used: The pasteurizers from which samples were obtained for study varied in capacity from 100 gallons to 800 gallons per hour and included the following types: Coil vat, glass-lined, cylindrical, spray vat and continuous flow (see table II). In all cases these pasteurizers were operated by the plant-owners.

TABLE I—Resumé of studies of heat resistance of *Brucella microorganisms*.

DATE OF PUBLICATION	INVESTIGATORS	PLACE OF INVESTIGATION	MICROORGANISMS TESTED	TYPE OF PASTEURIZATION	ORGANISMS PER CC	MEDIUM	TEMPERATURE	
							SURVIVED	DESTROYED
1903	Preis ⁵	Budapest	Bang's abortus	Laboratory (water-bath)	—	Sterile water	50° C—30+ min.	55° C—3 min.
1904	Dalton & Eyre ⁶	London	<i>M. melitensis</i>	Laboratory (water-bath)	1,700,000 to 7,050,000	0.85% NaCl	55° C —	57.5° C —
1909	M'Fadyean & Stockman ⁷	London	<i>Br. abortus</i>	—	—	—	—	55° C—2 hrs.
1911	Mohler & Traub ⁸	B. A. I. U. S. D. A.	<i>B. abortus</i>	Laboratory (water-bath)	—	0.85% NaCl	55°—56° C—45 min.	55°—56° C—60 min.
					—	0.85% NaCl	—	60° C—15 min.
					—	Bouillon	—	70° C—7.5 min.
1912	Fabyan ⁹	Massachusetts	<i>B. abortus</i> (Bang-Str. 1) <i>B. abortus</i> (Bang-Str. 2)	Laboratory (water-bath)	—	Bouillon	—	56° C—10 min. 59° C—10 min.
					—	—	—	60° C—10-15 min. 65° C—5-10 min.
1926	Zwick & Wedemann ¹⁰	Germany	<i>Br. abortus</i>	—	—	—	—	155° F—160° F—15-18 sec.
	Prescott <i>et al</i> ¹¹	New York, Pennsylvania and Michigan	<i>Br. abortus</i> (porcine) <i>Br. melitensis</i> (bovine)	Laboratory and commercial Electro-Pure process	—	Milk	—	—
	Proscholdt ¹²	Germany	<i>Br. abortus</i> (Bang)	—	—	Milk	—	60° C—10-15 min. 65° C—5-10 min.

1928	Boak & Carpenter ¹³	New York	Brucella (porcine)	Laboratory (water-bath)	—	Milk	140° F—15 min. 145° F—10 min. 145° F—5 min.	140° F—20 min. 145° F—15 min. 145° F—10 min.
			Brucella (bovine and human)		—	Milk	140° F—10 min. 145° F—10 min. 145° F—5 min.	140° F—15 min. 145° F—15 min. 145° F—10 min.
		New York	<i>B. melitensis</i> <i>B. abortus</i> (bovine, porcine, human—mixed culture)	Laboratory (water-bath)	5,000,000,000	Milk	140° F—7.5 min. 142° F—5.0 min. 145° F —	140° F—10 min. 142° F—7.5 min. 145° F—5 min.
1930	Zeller <i>et al</i> ¹⁵	Germany	<i>B. abortus</i> (Bang)	Laboratory (water-bath and Ahlborn heater)	—	Milk	— — —	55° C—25-30 min. 60° C—10-15 min. 65° C—5-10 min.
		Illinois	Brucella (caprine, bovine and porcine)	Laboratory (vacuum-bottles)	2,000,000 3,000,000 25,000,000	Milk Milk Milk	— — 146°-147.75° F—35 min.	142.5°-145° F—30 min. 142.5°-145° F—30 min. 146°-147.75° F—40 min.
	Bartram ¹⁶	Iowa	—	Laboratory —	—	—	139°-142° F —	144°-145° F—30 min.
		Maryland	Brucella (porcine, 3) Brucella (bovine, 2)	Laboratory (water-bath)	—	Milk	140° F—20 min. 142° F—30 min. 145° F—15 min.	—
1931	Boak & Carpenter ¹⁹	New York	<i>Br. suis</i> (10 cultures)	Laboratory (water-bath)	110,000,000 to 135,000,000	Milk	140° F—20 min. 142° F—30 min.	142°-145° F—20-30 min.
		New York (38 cities and 12 villages)	<i>Br. abortus</i>	Commercial	—	Milk	—	Destroyed by pasteurization in these cities and villages
	Gwatkin ²²	Canada	—	Laboratory and commercial	—	Milk	—	140° F—10-15 min.

TABLE I—Resumé of studies of heat resistance of *Brucella microorganisms*—Continued.

DATE OF PUBLIC- CATION	INVESTIGATORS	PLACE OF INVESTIGATION	MICROOR- GANISMS TESTED	TYPE OF PASTEURIZATION	ORGANISMS PER CC	MEDIUM	TEMPERATURE	
							SURVIVED	DESTROYED
1932	Park <i>et al</i> ²³	Illinois	<i>Br. suis</i> (sealed)	Laboratory (water-bath)	500,000,000	Milk	—	140° F—20 min. 142° F—15 min. 144° F—7 min.
			<i>Br. suis</i> (not sealed)		10,000,000 to 500,000,000	Milk	144° F—30 min.	—
			<i>Br. suis</i> (not sealed)		5,000 to 1,000,000	Milk	—	144° F—30 min.
	Murray <i>et al</i> ²³	Iowa	<i>Brucella</i> (porcine and bovine)	Laboratory Coil machine (lid open)	—	Milk	—	62°-63° C—3 min.
1934	Smith ²⁴	Scotland (8 plants)	<i>Br. abortus</i>	(lid open)	—	Milk	62°-63° C—30 min.	—
				Commercial (holding method)	—	Milk	—	145° F—30 min.
				Commercial ("Flash point")	—	Milk	145° F—momentarily	—
	Gwatkin ²⁵	Canada	<i>Br. abortus</i>	Commercial	—	Milk	Proper pasteurization destroys	

— = Information not available.

TABLE II—Examination of pasteurized and unpasteurized milk for *Brucella abortus*.

TYPE OF PASTEURIZER	CAPACITY (GALLONS PER HOUR)	PASTEURIZED				UNPASTEURIZED			
		SAMPLES	GROSS LESIONS	POSITIVE AGGLUTI- NATION	BRUCELLA ISOLATED	SAMPLES	GROSS LESIONS	POSITIVE AGGLUTI- NATION	BRUCELLA ISOLATED
Coil vat	100	3	0 1±	0	0	2	2 1±*	2	2
	200	6	1+	0	0	5	1+	2	2
	300	—	—	—	—	1	1	0	1
	450	4	0	0	0	2	1	1	0
	500	1	0	0	0	1	0	0	0
	800	1	0	0	0	1	0	1	1
Glass-lined	100	4	0	0	0	5	3	3	3
	150	2	0	0	0	2	1	1	1
	200	7	0	0	0	4	2	3	2
	600	2	0	0	0	2	2	2	2
Cylindrical	80	1	0	0	0	1	1	1	1
	100	4	1	0	0	4	2	2	2
	150	2	0	0	0	2	1	0	0
	200	7	0	0	0	5	1	0	1
Spray vat	100	4	0	0	0	6	3	4	3
	150	4	1	0	0	5	1	0	1
	200	13	2	0	0	11	8	8	8
Continuous flow	700	3	1	0	0	3	2	2	2
Totals	—	68	7*	0	0	62	33	32	31

*Lesions not typical of *Brucella abortus* lesions.

Source of samples: Milk samples* were collected in duplicate from 68 different milk stations located in 28 counties in Illinois, extending from Boone, McHenry and Lake counties on the north to Massac and Alexander counties on the south, a distance of approximately 250 miles. The sources of samples examined are shown in the map (fig. 1). The largest group of samples (31) examined from a single territory came from Sangamon County. The samples supplied for examination were collected before and after pasteurization from the vat of pooled milk of one or more herds. The pasteurized and unpasteurized milk samples thus represented composites of the milk of many different cows or herds. The samples were collected aseptically in sterile vials containing boric acid as a preservative agent and forwarded to the laboratory in mailing containers.

METHOD OF EXAMINATION

On arrival at the laboratory, a mixture of the milk and cream of each pasteurized and unpasteurized sample was injected subcutaneously into two or more healthy guinea pigs. During the years 1933 and 1934, a total of 233 samples of milk were received for examination. Guinea pig inoculations were successfully completed on 130 samples, including 68 pasteurized and 62 unpasteurized samples. Breakage in transit and spoilage incident to shipment, together with an intercurrent infection in one group of inoculated guinea pigs, made it impossible to complete the examination of 103 samples.

Four to six weeks following inoculation, the guinea pigs were autopsied. Blood was collected from each pig for the agglutination test, while evidence of gross lesions of *Brucella* in liver and spleen was noted. The heart-blood and spleen of each guinea pig were streaked on gentian violet liver agar plates and allowed to incubate for three to five days in an atmosphere of 10 per cent carbon dioxide. At the end of this incubation period, colonies which resembled *Brucella* were picked and agglutination tests were made with known positive abortion serum. The species of *Brucella* was determined by means of the differential dyes recommended by Huddleson.⁴

RESULTS

None of the 136 guinea pigs inoculated with the 68 pasteurized milk samples reacted to the agglutination test. Likewise cultures from liver, lungs, testes, lymph-glands and spleen showed no evi-

*Samples were collected by inspectors of the State Board of Health under the supervision of Mr. S. V. Layson, milk sanitarian, State Department of Public Health.

dence of *Brucella* (see table II). Gross lesions were observed in seven of these pigs, but since these lesions were not exactly typical of those caused by *Brucella* and since the agglutination tests were negative and no *Brucella* were isolated, it is believed that the lesions were not caused by any species of *Brucella* and that none of the 68 samples of pasteurized milk contained viable *Brucella*.

A total of 45 out of 124 guinea pigs inoculated with the 62 unpasteurized milk samples gave a positive agglutination test in dilutions of 1:100 or higher, while one gave a positive test in a dilution of 1:50. Gross lesions were observed in the spleen

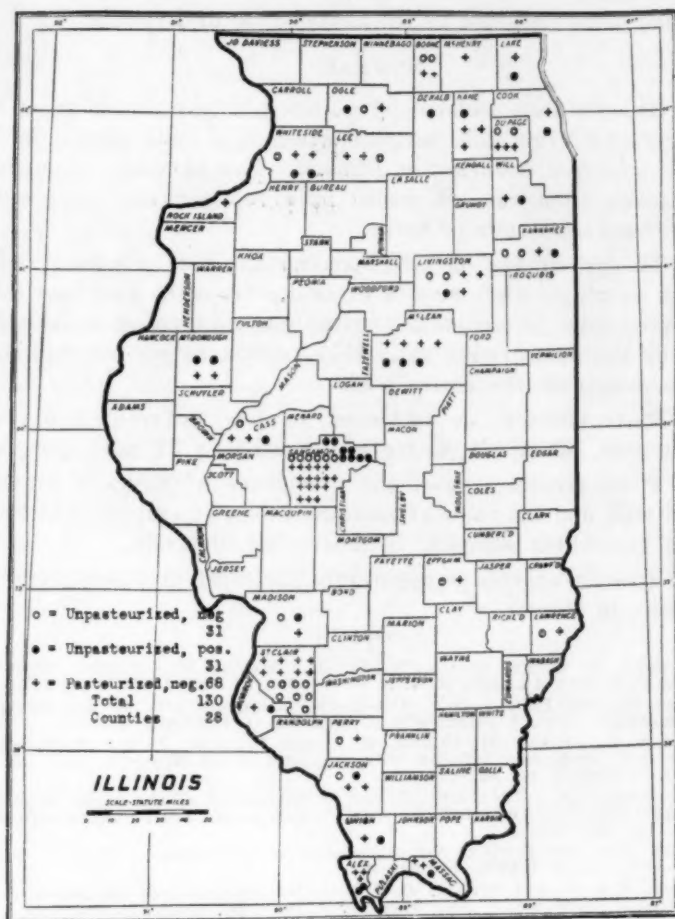


FIG. 1. Source of milk samples examined for *Brucella abortus*, 1933-34.

and liver of 73.3 per cent of the guinea pigs which had an agglutination titre of 1:100 or more, while *Brucella* were isolated from 77.7 per cent of these pigs. The guinea pigs from which *Brucella* were isolated had been inoculated with 31 samples of unpasteurized milk. Therefore 31 (50 per cent) of the 62 unpasteurized milk samples contained viable *Brucella*, while none of the 68 pasteurized samples were found to contain *Brucella* (table II).

Since all cultures of *Brucella* isolated from guinea pigs produced hydrogen sulfide, were inhibited by thionin in a dilution of 1:30,000 and not at all or very slightly inhibited by basic fuchsin, 1:25,000, pyronin, 1:200,000 and methyl violet, 1:100,000, they were classified as the bovine type of *Brucella*.

SUMMARY

1. *Brucella* were isolated by guinea pig inoculation from 50 per cent of 62 raw milk samples collected at milk depots in 28 widely scattered counties in Illinois. The samples inoculated were taken from vats of pooled milk representing composites of many different cows or herds.

2. The percentage of infection encountered in pooled milk, though seemingly high, may be explained from the fact that contaminated milk is composited with uncontaminated milk upon entering the pasteurizing vat. Milk from a single infected cow may contaminate the entire pool.

3. Pasteurization, as employed in five different types of pasteurizers, effectively destroyed *Brucella* in 31 milk samples.

4. These results suggest the prevalence of *Brucella* in raw pooled milk and the value of pasteurization, as employed in milk depots furnishing samples, in destroying *Brucella*.

5. *Brucella abortus* is apparently the most prevalent type in raw milk in Illinois.

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Ohio Membership in the A. V. M. A.

Year	Members	Year	Members
1923	248	1930	280
1924	200	1931	289
1925	177	1932	273
1926	191	1933	252
1927	203	1934	230
1928	236	1935	233
1929	256	1936	?

OBSERVATIONS ON COMPLEMENT-FIXATION WITH DISTILLED WATER-SPLEEN ANTIGEN IN EQUINE INFECTIOUS ANEMIA*

By W. M. MOHLER, Washington, D. C.

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At the Twelfth International Veterinary Congress in New York, in 1934, excellent papers on equine infectious anemia (swamp fever) were presented by Mócsy,¹ of Hungary, and Král,² of Czechoslovakia. They were supplemented by reports and discussions by Thorshaug, of Norway; Schermer, of Germany; Wall, of Sweden, and Steck, of Switzerland. The reporters (Mócsy and Král) seemed to be in agreement with Stein³ and other workers on this disease in the United States on the following facts:

(1) That the only definite clinical symptom of practical importance in the diagnosis of the disease is the intermittent character of the febrile period.

(2) That all laboratory tests heretofore advocated in the diagnosis of the disease are frequently indefinite or non-specific and therefore non-dependable.

(3) That the only method thus far known of satisfactorily diagnosing early stages of the disease or latent infections (the so-called virus carriers) is the experimental inoculation of blood of a suspected animal into a normal equine for test purposes.

While a number of laboratory diagnostic tests have been studied in the past by investigators interested in this line of activity, they have not been found to be sufficiently satisfactory to warrant their adoption. These diagnostic tests included complement-fixation, hemagglutination, saponin hemolysis, soap hemolysis, precipitation, Meinicke's reaction, isolysin reaction, sero-chemical test, the mercuric chloride test, liver puncture, allergic tests, and several others, including the diagnostic inoculation of the usual laboratory animals.

The mercuric chloride test has been studied rather extensively by the Bureau but the results obtained through the use of this method of diagnosis indicated the test to be non-specific and of limited diagnostic value. Several European investigators advocate the method of puncturing the liver by the use of a trocar and then examining the liver tissue microscopically to determine the increase of the interlobular connective tissue and the excessive

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number of lymphoid cells in the capillaries. This test, however, is quite impracticable.

The early workers on infectious anemia in the Bureau attempted to develop the use of the complement-fixation test for the diagnosis of this disease. They had been so highly successful in applying this test to glanders, dourine and other diseases, that they endeavored to prepare an antigen from various tissues by the same or similar methods, but always with negative and not even encouraging results.

In the early fall of 1935, the Bureau had a number of experiment horses which came to autopsy following acute swamp fever infection. Therefore, in a short time a large amount of material was made available for complement-fixation studies and the results obtained have been of sufficient interest so that this preliminary statement on our observations with this reaction is presented in order that the information may be available to others interested in this line of activity.

As animals died from swamp fever infection, the brain, kidneys, liver and spleen were collected and treated in several ways for antigenic purposes. A large number of serum samples from animals in the advanced stages of swamp fever also were available and the various antigens were tested against a large number of these serums. Acetone and alcohol tissue extracts, as well as saline and distilled water extracts, were used in the preparation of antigens from the various tissues. Only the distilled water and saline extracts of spleen tissue gave any evidence of antigenic value and this was evident only against one serum. The distilled water extract was found to be superior to the saline extract and therefore efforts were concentrated on the distilled water-spleen extracts, testing their antigenic value with this serum.

The method of preparation of the spleen antigens was as follows: A section of spleen tissue is weighed and ground up in a mortar until it is finely divided. A small amount of distilled water is added to the tissue and it is further diluted to the point where there are two parts of distilled water to one part of spleen tissue. The emulsion is filtered then through fine cheesecloth and immediately placed in the refrigerator for further use. Portions of the spleen not used at the time are placed in the refrigerator at 0° C. It has been found that such spleen tissue could subsequently be prepared into a suitable antigen. The addition of preservatives proved to be unsatisfactory and only refrigeration at low temperature is used to preserve the antigen.

The serum first used, against which antigens were titrated, was from a horse that had been artificially infected with swamp fever

and in addition had received a second injection of swamp fever virus. It is of interest to note that the serum from this animal, taken prior to the second injection of virus, failed to fix complement in the presence of spleen antigens, whereas the same serum one week after the injection of the second sample of virus fixed complement very strongly in the presence of the same antigens. In all of these subsequent tests, this serum was used as our positive serum.

Since our investigations were begun last fall, 22 spleens taken from horses which died from swamp fever have been tested for their antigenic value. Fourteen of these gave very definite evidence of being antigenic. Eight spleens failed to show any antigenic value, although all of these animals died of acute, subacute, or chronic swamp fever. Spleens of horses which have died three to five weeks after inoculation with the virus of swamp fever have quite generally shown antigenic value.

In testing a number of antigens under similar conditions, it was found that there was quite a variation in their antigenic value. Samples of serum from our experimentally infected horses were drawn at frequent intervals and tested against various spleen antigens. To date, 18 animals out of 22 have given a positive reaction to the test at some time during the course of the disease. In most of these cases, positive reactions were transitory. The remaining four have failed at any time to give a positive reaction.

A point of interest has been evidence of fluctuating antibody content in certain of the serums giving a positive reaction. In the majority of instances an animal has given a positive reaction for a few days only; the reaction then has decreased until it reached the negative point.

During these investigations, a natural case of swamp fever came to our attention. A serum sample from this animal gave a 4+ reaction to the complement-fixation test. The blood from this animal was injected into a normal animal which reacted with a typical case of swamp fever 19 days after inoculation. Serum taken from animals suffering from anaplasmosis, dourine, glanders, swine erysipelas, as well as a sample of hyperimmune hemorrhagic septicemia serum, gave negative reactions to the complement-fixation test using spleen extract of swamp fever-infected animals as antigens, with the exception of one sample of a positive field case of dourine which gave a positive reaction. No history on this animal was available, but it originated in a general territory where swamp fever has been reported.

In conclusion it seems proper to state that the complement-fixation test for infectious anemia of horses (swamp fever) is still in the experimental stage, but the results have been so encouraging that this preliminary statement is presented in an effort to further similar diagnostic investigations of other research workers who are interested in this line of diagnostic work.

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Good Work, South Dakota

Members of the South Dakota Veterinary Medical Association will participate in a group movement in Sioux Falls, May 4-9, to effect the organization of an Interprofessional Council. Other bodies interested in the project are the South Dakota State Medical Association, the South Dakota State Dental Association, the South Dakota State Nurses Association, the South Dakota State Hospital Association and the South Dakota State Pharmaceutical Association. It is expected that these organizations will attract a total attendance of 1200 to 1500. South Dakota veterinarians are to be congratulated for taking part in this worthy movement.

1884—1905—1920—1936

Did you know that the A. V. M. A. convention to be held in Columbus in August will be the fourth meeting held in Ohio? Many present members will recall the fine meeting held in the Ohio capital in 1920. Some will remember the very enjoyable convention held in Cleveland in 1905—and the boat-ride on Lake Erie! But who recalls the meeting in Cincinnati in 1884, when the old United States Veterinary Medical Association invaded what was then "the West," for the first time? September 16, 1884, was the date. There are just three members on the roll today who were members at that time.

**73rd Annual Convention A. V. M. A.
 Columbus, Ohio, August 11-12-13-14**

CLINICAL AND CASE REPORTS

A decorative banner at the top of the page contains the title 'CLINICAL AND CASE REPORTS' in a bold, serif font. To the left of the text is a small illustration of a vintage car, and to the right is a small illustration of a person, possibly a doctor or a patient, in a clinical setting.

THE PREVENTION OF MYIASIS IN WOUNDS OF DOMESTIC ANIMALS BY THE USE OF "BONE OIL"*

By J. A. HOWARTH, *Davis, Calif.*

Division of Veterinary Science, University of California

The usual methods of preventing myiasis in open wounds of farm animals have frequently proved unsatisfactory, especially under conditions existing during the summer in central California. During the past summer and fall, the writer has obtained satisfactory results in protecting open wounds from flies by using applications of bone oil.

Bone oil is a by-product of the manufacture of bone coal, and is a complex mixture of organic substances. The chemical content of various lots is said to vary widely, but its physical properties are sufficiently uniform for all practical purposes. It is a tar-like, semi-solid material, black, viscid, and extremely adhesive to skin and wound surfaces. On account of its chemical stability and tenaciousness, its protective qualities, even when spread thinly over large open wounds, are but slightly diminished even after several days. It has a very strong and highly pungent odor, somewhat resembling the odor of gases which escape in the process of refining crude oil. Certain samples may contain traces of cyanide, resulting from the breaking down of proteins under high temperature, but it is probable that the concentration is not sufficient to cause poisoning.

The samples used in these experiments were obtained gratis from the Pacific Bone Coal and Fertilizing Company, Financial Center Building, San Francisco, California, but the product is not yet distributed commercially. Representatives of the firm stated that if a commercial demand for the material develops, it could be marketed at a price sufficiently low to justify its use even on farm animals of low value.

Bone oil has been applied to various kinds of wounds infected with various larvae, including *Cochliomyia macellaria*. The rou-

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tine procedure was to use benzol for the destruction and removal of the larvae, after which a generous amount of the bone oil was supplied to the wound. Trials were made on cattle, sheep, horses and hogs. In no case was there a reinfestation of the wound, and healing was exceptionally rapid, showing no detrimental effect of the bone oil on the tissue. In one case this repellant was successfully used on the wound of a sheep where the raw surface had an area of approximately one square foot. There appeared to be no absorption of toxic material, and healthy granulation and repair took place without an excessive amount of exudate.

From the success in treating wounds already infested, it appears that the use of bone oil in immediately coating wounds caused by castration, dehorning, branding, shearing, barbed-wire cuts, and so forth, would be an effective safeguard against myiasis.

A series of trials using bone oil as a repellant were carried out under conditions simulating those found under natural conditions. Experiment sheep, killed for other purposes, were skinned, and legs of mutton were placed in the sheep corrals on boxes. Bone oil was applied to several of these, while others were left untreated. Flies were very abundant at the time, and large numbers alighted on the untreated meat. However, the mechanical protection and the odor or other effects of the bone oil apparently prevented the flies from striking on the treated meat. Observations were made twice daily, and the untreated meat was found to be heavily infested with egg masses the first day, while the meat treated with bone oil exhibited no egg masses at the end of ten days. Even after the surface of the meat became dry and the bone oil had lost most of its sticky quality, the flies which did light upon it remained only for a brief period. The species of flies responsible for the egg masses on the untreated meat were not determined, as cold weather intervened and prevented development and identification of the flies.

To summarize, these experiments have proved that bone oil has a strong repellant action on Diptera. A thin covering of this tenacious substance effectively prevents flies from depositing their eggs on open wounds of domestic animals, thereby protecting the wounds from the larvae which cause myiasis. It has been successfully used on various types of wounds of cattle, sheep, horses and swine. No apparent injuries to extensive areas of raw tissue have been observed, and wounds coated with bone oil have healed rapidly. The product can probably be marketed at a price which will render it practical for extensive use in the animal industries.

KINKY TAIL IN CATTLE*

By M. W. EMMEL and BRADFORD KNAPP, JR.

Agricultural Experiment Station, Gainesville, Florida

Kinky tail or "screw tail" in swine has been described by Nordby,¹ who gave evidence to show that it is an inherited character. Kinky tail has been observed by the authors in a pure-bred herd of Red Polled cattle. The affected calves were born with a distinct kink or kinks in the lower portion of the tail. In either case the tail had a distinctly crooked appearance. This character differs considerably from the "wry tail" character described in Jersey cattle by Atkeson and Warren.² The wry tail character affected the base of the tail, causing the tail to hang from an angle rather than straight.

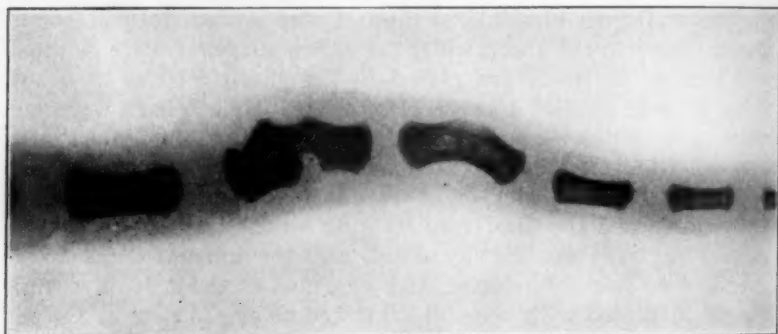


FIG. 1. X-ray of the tail of a three-week-old calf showing complete fusion and incomplete fusion of two coccygeal vertebrae.

The x-ray in figure 1 was taken of the tail of a three-week-old calf which had a double-kinked tail. The lower involvement at this time showed the complete fusion of two coccygeal vertebrae, and the upper involvement showed two disarranged vertebrae, the articulation still possessing considerable mobility, particularly laterally. A month later, however, these four vertebrae were removed from the tail by surgical operation and the upper pair showed complete fusion.

Four animals have been observed with this character. In each instance in which there was mobility at the kink at birth, fusion was complete four to six weeks later. The crooked appearance of the tail becomes more pronounced with age. Figure 2 shows a single crook in the tail of a one-month-old calf while figure 3

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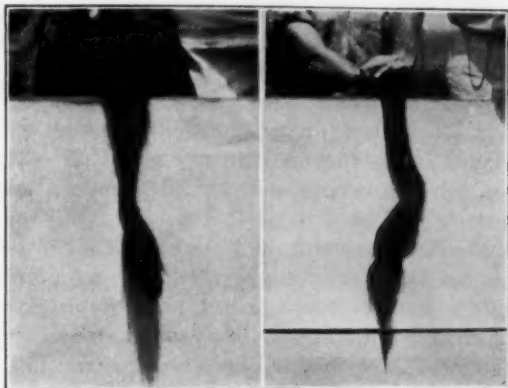


FIG. 2 (left). Single crook in the tail of a four-week-old heifer calf.

FIG. 3 (right). Double crook in the tail of a four-month-old bull calf.

shows the appearance of a double crook in the tail of a four-month-old bull calf. In all instances in which kinks were observed, pairs of adjacent vertebrae were affected.

The number of animals involved in this study do not permit more than a hazardous guess as to the inheritance of the character. The defect is apparently due to a single Mendelian recessive character.

The operation for the removal of the fused vertebrae consisted of making a dorsal longitudinal incision over the major portion of the involved vertebrae and carefully dissecting them from the surrounding tissue after the lower articulation with the normal vertebrae had been severed. Considerable caution is necessary

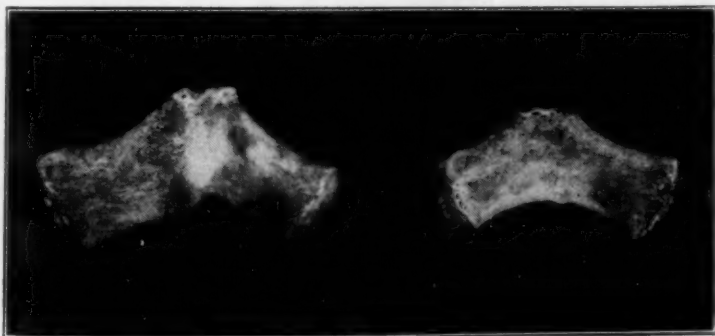


FIG. 4. The appearance of the coccygeal vertebrae removed by surgical operation from a seven-month-old calf. Same animal as in figure 1.

to avoid the lateral blood-vessels, because in the region of some kinks these vessels were found to be in an abnormal location. The wound was then sutured and cleaned daily until after the stitches were removed five days later.

After the incision has healed, the portion of the tail from which the vertebrae were removed should be placed in a light splint to insure immobility during organization of the cicatrix. In cases in which this is not done, organization will not take place evenly and there will be a point in the operated area which will be extremely limber, resulting in a slightly crooked tail. Animals with this defect may best be operated shortly after birth. In older animals a distinct pouch in the skin occurs over the angle of the crook and it is necessary to reduce this pouch so that the tail will show no enlargement at this point when healing is complete.

As kinky tail is in all probability an inherited character, the operation would be advisable only in those instances in which the animal would be used for show purposes.

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TUBERCULOSIS IN A HERD OF HOGS WITH ONE HUNDRED PER CENT MORTALITY*

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This herd was comprised of twelve sows and 68 pigs. All the pigs were farrowed by these sows in the early summer of 1934, and all had access to blue grass pasture. On the same range was the farm flock of chickens, consisting of approximately 50 birds. Both hogs and chickens were fed skim milk from the farm herd of 15 head of grade cattle.

The owner stated that his herd of cattle had been tested for tuberculosis in December, 1933. Information from the Indiana Live Stock Sanitary Board revealed that this herd was last tested in December, 1927, and at that time there were six cows in the herd, all of which were negative.

The pigs were weaned in September and shortly afterwards were vaccinated against hog cholera. The first pig died in ap-

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proximately two weeks after vaccination, and several more died during the next few months. It was not until the latter part of December, 1934, and the first part of January, 1935, that the death rate became alarming. By February, 56 pigs had died and in early April the entire 68 head of pigs and the twelve sows were all dead. The sows died mostly during the last few months of the period although a few died in the fall. There were no death losses in the chickens or cattle.

On January 30, the first pig was brought to the laboratory for autopsy. It was a very emaciated Chester White gilt, weighing about 40 pounds. Large, firm swellings were palpable in the throat region, which proved to be greatly enlarged mandibular lymph-glands. All other head glands were much enlarged and showed the same characteristic changes. A longitudinal incision in one of the mandibular glands revealed a heavily encapsulated gland composed of a solid grayish-white caseous necrotic material through which extended many irregularly-shaped, fine, yellowish, calcareous, trabecula-like structures. The cut surface measured 10 cm long and 6 cm wide.

The pharyngeal mucosa was thickened and had the appearance of a dark brownish, leather-like material.

The mesenteric lymph-nodes, although only slightly enlarged, showed the same general appearance as the head glands. Aside from the general emaciation there were no other gross lesions. Sections of lymph-nodes were fixed in 10 per cent formol and also in Zenker's solution for future examination.

On February 8, a second pig, in the same general condition, was brought in for examination. The glandular lesions were less advanced and there was only a slight change in the pharyngeal mucosa as compared with the first pig. In addition, there was a large, circular, fetid ulcer in the skin and subcutaneous tissues over the right scapula. The same brownish, leather-like appearance was noticed here as in the pharynx of the first pig. This ulcer had discrete borders and measured 12 cm in diameter. Sections from the head glands and the ulcer were taken for future examination. Up to this time sections from the first case had not been examined.

Under aseptic conditions a small, pea-size section was removed from the central part of one of the mandibular glands of the second case and inserted under the skin of a rabbit at the base of one ear. This rabbit had been in stock for over six months and was in excellent physical condition. At the end of two weeks, the mass of tissue was apparently absorbed and no trace of inflammatory reaction remained.

The rabbit was kept in quarantine and examined at frequent intervals. During the latter part of March, there was a slight swelling noticed at the base of the ear, which ruptured in a few days and formed a small ulcer. This increased in size until it was nearly two centimeters in diameter. By this time the rabbit was gradually becoming emaciated. On April 15, it died and emaciation was then well marked. There was only a slight discharge from the ulcer but considerable induration was present around its margins. The odor had become very fetid in character.

Smears were made from the deeper sections of the ulcer and many acid-fast organisms were demonstrated. Several serum-agar shakes inoculated from similar areas showed no growth for anaerobes after incubation for three weeks.

The autopsy of the rabbit revealed generalized lesions in the lungs, kidneys, spleen, pleura, and mesenteric lymph-nodes. They consisted of small, grayish, multiple foci ranging from approximately 0.5 mm to 2 mm in diameter. Acid-fast organisms were demonstrated by direct smears from all these organs.

At this time sections were examined from the two field cases. They were not entirely typical of tuberculosis although they suggested it. Acid-fast organisms, however, were demonstrated in sections. Sections from the rabbit were examined and showed characteristic tubercle formation. Another stock rabbit, a 40-pound gilt, a White Leghorn hen and a guinea pig were selected for inoculation purposes. The gilt was tuberculin-tested with both avian and bovine tuberculin, while the hen was tested with avian only. Both were negative. The guinea pig and rabbit, both of which had been in stock for several months, were not tested.

A lung emulsion was made from the first inoculated rabbit and injected into the above rabbit, pig, guinea pig and hen.

Table I gives a summary of the results of the inoculations.

TABLE I—Results of inoculations.

ANIMAL	INJECTED	METHOD OF INJECTION	AMOUNT (cc)	DIED	AUTOPSY FINDINGS	MICROSCOPIC EXAMINATION
Rabbit	4-18-35	Intrav.	0.5	4-19-35	No lesions	Not made
Pig		Intrav.	1.5	5- 3-35	Generalized	+
G. P.		Intrap.	1.0	5- 1-35	Localized	+
Hen		Intrap.	2.0	6-28-35*	No lesions	Not made

*Destroyed.

A more detailed account of the results of these inoculations tends to convince one that a mammalian type of tubercle bacillus was the causative agent.

The rabbit died on the day following the infection. No cultures nor direct smears were made. No gross lesions of any sort were seen.

The pig was observed daily for symptoms. On the 26th, anorexia was developing, along with emaciation. It was slow and moved reluctantly. The symptoms gradually increased and at the same time a dry, hacking cough developed. These symptoms steadily increased until May 2, when the gilt was so weak she could not stand. Death occurred the next day.

This gilt was autopsied. The outstanding lesions were confined to the lungs, which showed a slight generalized edema with a small amount of atelectasis in the dependent portions of the anterior lobes. The pleura was covered with thousands of minute, pin-point, yellowish foci which were less than a millimeter apart. On section, the entire parenchyma of each lung showed the same kind of foci. The mediastinal and bronchial lymph-nodes were enlarged and edematous. Sections showed many yellowish foci throughout which were 2 to 3 mm in diameter. The gastro-hepatic lymph-nodes were enlarged and also showed similar lesions. Slight edema was seen in the mesenteric glands. No other gross lesions were seen.

The guinea pig was dead on May 1. Emaciation was present, and ascites also was noted. The only definite lesion found was a mass of caseous tissue 4 cm long and 1 cm in diameter, on the greater omentum, near its attachment to the stomach.

The hen had improved in physical condition and was in production when destroyed on June 28. No pathological lesions were seen at autopsy.

Sections from all the various organs and lymph-nodes of the pig as well as the large mass of tissue from the guinea pig were prepared for sectioning. Well defined tubercle formation was demonstrated in all the sections examined. Duplicate sections for acid-fast staining were made and tubercle bacilli were found. Direct smears also were prepared and all were positive for acid-fast organisms.

Attempts to grow the organism were not successful. A series of 40 inoculations was made from the various organs and glands of the pig and the lesion of the guinea pig, on glycerinated saline potato slants and Loeffler's media. Several tubes were contaminated but the majority of slants after incubation for 90 days showed no growth.

DISCUSSION

An outbreak of tuberculosis is reported in hogs in which there was a 100 per cent death rate from September to April. Autopsies were made on two field cases from this outbreak of tuberculosis and in each instance acid-fast organisms and tubercles were demonstrated in various sections prepared for microscopic examination.

Animal inoculations for typing purposes, although not entirely complete, were carried out. Acid-fast organisms and tubercles were demonstrated in a rabbit that had been inoculated subcutaneously with tissue from one of the field cases. A lung emulsion, prepared from this rabbit, was injected into a pig, hen, guinea pig and rabbit. In 15 and 13 days, respectively, the pig and guinea pig died and each showed lesions of tuberculosis and acid-fast organisms also were found. The results of these inoculation experiments demonstrated that an acid-fast organism, apparently of the bovine type, was the causative factor.

The innocuous effect of the lung emulsion on the hen also tends to substantiate this last statement.

The lung lesions in the inoculated pig were miliary in character.

Attempts to grow the acid-fast organisms on the culture media used were negative. A medium such as Herrold's egg-yolk agar might have produced better results.

Negative results from the anaerobic shake cultures made from the deep structures of the ulcer in the ear of the inoculated rabbit, together with an apparently complete absorption of the inoculated tissue after two weeks, eliminated the possibility of *Actinomyces necrophorus* playing any particular part in this outbreak, although some of the lesions in the field cases resembled this infection.

ENCEPHALITIS IN HORSES*

By L. P. DOYLE, LaFayette, Ind.

Department of Veterinary Science
Purdue University Agricultural Experiment Station

An encephalopathic disease was rather prevalent in horses in parts of Indiana during the fall and winter of 1934 and 1935. Some cases of this disease presented an opportunity for more or less detailed examination. In some cases the clinical manifestations were extremely violent. In other cases there were vary-

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ing degrees of paralysis of the facial muscles and of the swallowing apparatus. Amaurosis, lethargy, moving in circles, pushing forward, hyperesthesia and difficulty in being led were other symptoms noted. Icterus was observed frequently.

The significant postmortem findings were usually limited to the brain. A conspicuous gross brain lesion which was frequently found consisted of a softened area in the cerebrum. This softened area was yellowish in color, and usually showed more or less evidence of hemorrhage. These softened areas were sometimes large enough to involve the greater portion of an en-



FIG. 1. An affected horse, showing lethargic symptoms. This animal on autopsy was found to have a large softened area in the cerebrum.

tire cerebral hemisphere. This encephalomalacia was observed in some affected horses which had shown clinical improvement for a time but had died suddenly. In other instances it was found in cases which became progressively worse from the onset of symptoms.

Microscopic examination of the brain showed edema, with more or less hemorrhage, to be the most common change. In some instances the hemorrhages were quite sharply perivascular. There

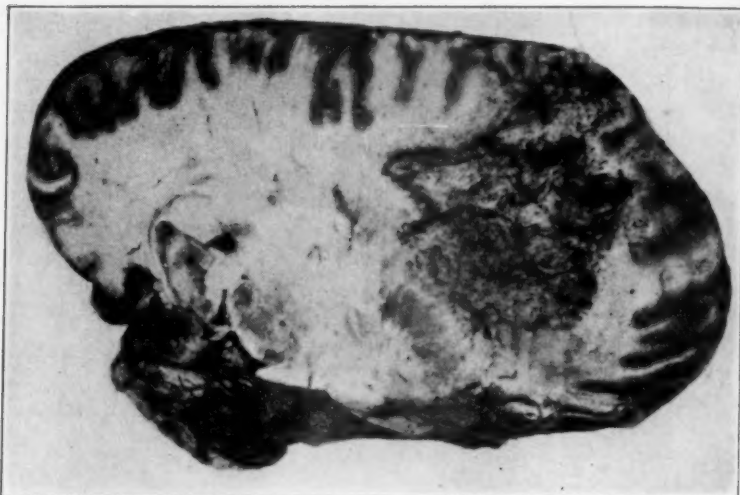


FIG. 2. A longitudinal section of a cerebral hemisphere of a horse, showing a softened area in its anterior portion.

was also a well-marked cellular reaction found in several cases. The cellular reaction took the form mainly of perivascular accumulations of cells which were mostly lymphoid in type; monocyte type of cells and polymorphonuclear leukocytes also occurred.

Microscopic examination of the softened areas in the cerebrum showed marked degeneration of the brain substances, edema and hemorrhage, without much evidence of proliferative change in the stromal elements. The periphery of these softened areas sometimes showed perivascular accumulations of cells. In some instances marked "cuffing" of blood-vessels was observed, which did not bear any noticeable relationship to the large, softened areas. The nerve cells did not show well-defined intranuclear inclusions, but cytoplasmic inclusions were found in some cases. These cytoplasmic inclusions appeared acidophilic and faintly granular.

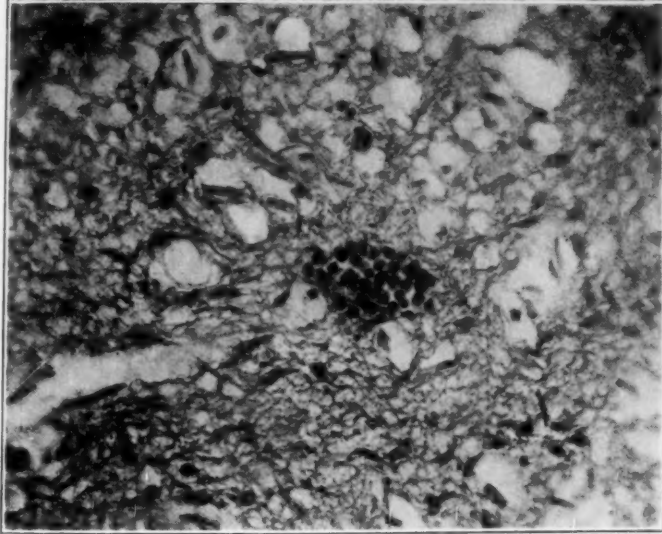
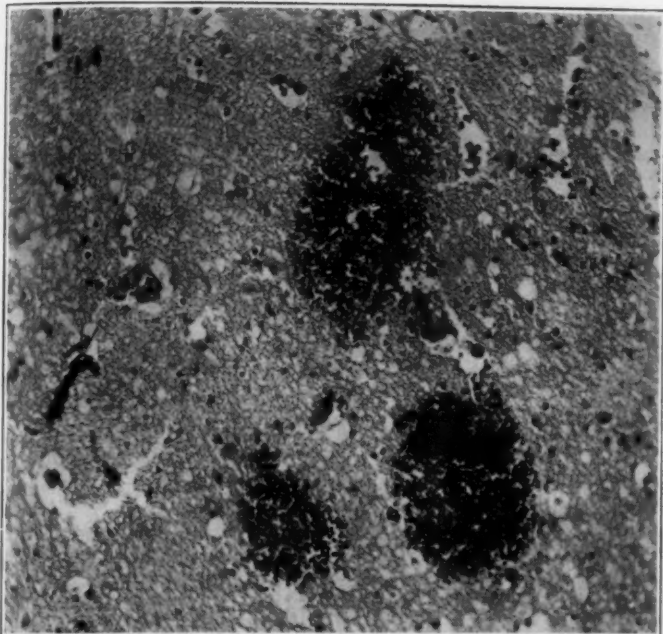


FIG. 3 (above). A section of horse brain showing discrete hemorrhages.

FIG. 4 (below). A section of horse brain stem showing a focus of round cells.

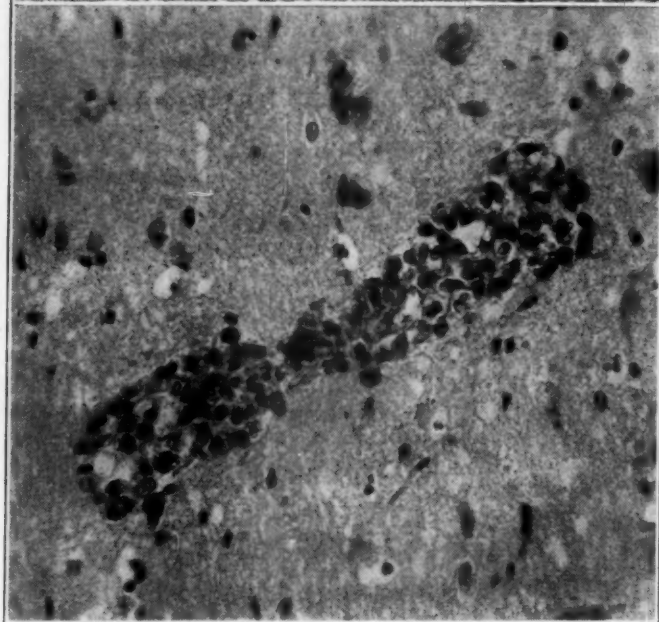
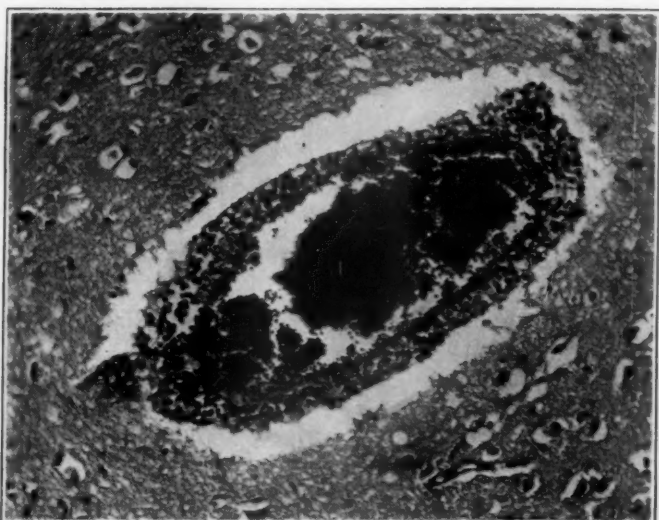


FIG. 5 (above). A section of horse brain showing marked "cuffing" of a blood-vessel.

FIG. 6 (below). A section of brain (cerebrum) of a guinea pig inoculated with filtrate of a horse brain.

Guinea pigs were injected intracranially with filtrates of brain of horses which had died of the disease. In two instances (two of 21 trials) the injected guinea pigs developed encephalitis within ten days. Microscopic examination of the brain of the guinea pig showed perivascular accumulations of cells similar to what occurred in the naturally affected horses. Bacteria could not be demonstrated in the brain tissue of these guinea pigs.

DISCUSSION

It is obvious, of course, that the precise nature of this horse disease was not fully determined. It would seem, however, that the type of microscopic change found, particularly the perivascular accumulations of cells, indicates an infectious agent as the cause. The relationship between this disease and the encephalomyelitis, which has already been described, remains to be determined.

CANCER IN DOMESTIC ANIMALS*

By L. A. MERILLAT, Chicago, Ill.

Because cancer in domestic animals is not economically significant, veterinary pathologists *per se* have not added much to the knowledge of that grave affliction. Judged from clinical work, the occurrence of the disease is not high in domestic animals and it usually arrives when the victim has declined in value on account of age. Cancer, in general, is a disease of the adult and aged. It attacks domestic animals after they have served much of their usefulness, and, thanks to the usual places of delectation and tendency to remain local, cancer in animals does not rapidly disable the victim.

In our surgical work, it has been observed that such cancers as epitheliomata of the penis, conjunctiva, dental alveoli and mammae, in horses, swine and dogs, attain considerable proportions and sojourn indefinitely without becoming metastatic. In our observations, metastatic foci have been exceptional and the state of cachexia characteristic of human cancer, except that arising from local encroachment, was almost entirely absent from the clinical picture. True, in all cases the peripheral rooting was sure but it was always slow.

Cancer of the mammary tissue of the mare, sow and bitch (we have never seen a mammary cancer in the cow), starting in the substance of the mammary gland, after invading the organ

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more or less completely, invades the abdominal integuments and becomes non-operable by spreading in every direction into their structure (aponeurosis, muscle, peritoneum). Alveolar cancers of the horse dig into the periosteum of the teeth and maxillae, invade the nasal passages and sinuses, destroy extensive areas of the skull, but they break down the health only by encroaching upon respiration and mastication or through pyogenic complications; that is to say, they do not undermine the health until the organic intrusion has become grave. But what has always seemed to be a clinical distinction is that the involvement of the adjacent lymphatic chain is no more pronounced than from reactions to benign trouble in the same region.

Cancers of younger animals, encountered in the routine of clinical work are usually, if not always, sarcomata of which the osteosarcomata affecting the incisor region are examples. We have seen enormous sarcomata of the withers, of the front of the shoulder and breast, and of the large muscles of the femoral region in young and middle-aged horses, but have no record of similar cancers in other species, commonly as they are reported in the literature by meat inspection services and clinics where meticulous attention is given to histopathological diagnoses of new growths. Most "lumps" extirpated in clinical work are not identified.

The brilliantly illustrated lecture given by Professor Fitz-Patrick at the annual meeting of the Illinois State Veterinary Medical Association, in February of this year, was a reiteration of the fact that in cancer modern medicine has hit its most puzzling problem and obviously the greatest. As expressed in a recent issue of *Hygeia*, cancer is no respecter of persons or personages. It has been set down in medical literature as the most terrifying of chronic maladies for 25 centuries, all of the while eliciting not entirely in vain the attention of the most brilliant minds in the field of research. Certainly no disease has brought out a more voluminous literature and none has remained more mysterious from the etiological point of view. This does not mean, however, that cancer research has not been fruitful. It has contributed richly to cytology, especially to the physiology of cytoplasm and the reckless behavior of unchecked proliferation.

In regard to therapeutics, the importance of early diagnosis and treatment has been shown to be imperative. The surest cure for cancer, wherever located, is early extirpation or x-ray irradiation. The latter, in the hands of experts, has a marked inhibitory action on the cancer cell. The lethal action of x-rays driven

through cancerous tissue is striking. Demonstrations to that effect by means of moving pictures are well known in human medicine. Paraphrasing, precocious diagnosis, which is difficult in internal cancer, early ablation of external localizations and the inhibiting action of x-ray on the proliferation of the cancer cell, offer considerable hope, notwithstanding its baffling etiology.

In discussing cancer in animals from the clinical point of view, the melanotic tumor of the gray horse cannot escape notice, for here is an example of the mistakes veterinary pathologists have made in classifying diseases by copying the concepts of human pathologists. The melanotic tumor of the old gray horse is not a cancer. It is the most benign of new growths. In the strict sense of the term it is not a tumor but a collection of a chemical substance (melanin) in the tissues. When extirpated, the traumatic cavity cicatrizes promptly and is never the site of a recurrence. In fact, owing to the abundance of connective (formative) tissue in which the collection is located, the wound heals with unusual rapidity and the scar is unusually dense, ischemic and solid. It is a multiple, not a metastatic, affair. The melanotic sarcoma of animals is one thing, the melanotic tumor (so called) of horses is a bird of another feather. A tumor, as any other tissue, can become pigmented, but no cancerous growth in animals collects pigment *en masse*, as does the melanotic tumor of the gray horse, which is perfectly compatible with health as long as it does not interfere with the function of the affected or adjacent organs, such as the anus, vulva, spinal cord or brain.

Needless to recall, the malignant, non-cancerous growths of infectious origin so commonly encountered in animals: actinomycomata, botryomycomata, bacillomycomata and certain granulomata of the vagina and conjunctiva, in which no cancer cells are present but which behave much the same as do cancers, when partially extirpated.

The object of this brief discussion is to report that as far as can be determined from clinical observation, the cancer cell in domestic animals is not so apt to run riot as it does in the human being nor to impregnate the system with prostrating intoxications.

**73rd Annual Convention A. V. M. A.
Columbus, Ohio, August 11-12-13-14**



REVIEWS

HISTOIRE DE LA MÉDECINE VÉTÉRINAIRE. E. Leclainche, Membre de L'Institute. Octavo, xvi + 812 pages. Office du Livre, Toulouse, France, 1936. Paper, 80 francs.

Out of a troubled sky comes a literary classic on veterinary history, covering the subject from the remotest antiquity to 1936, portraying with remarkable clarity and understanding the achievements, failings and vicissitudes of animal medicine since the obscurity of the primitive civilizations. It would require considerable space and no end of time to review and do justice to this masterpiece. It should be translated into English and studiously read in the United States, where the simplest facts upon which animal medicine must erect its domicile are yet to be known, even among those upon whom rests that responsibility.

To the uninformed reader, the history of animal medicine is disconcerting; only the ancients and certain scientific societies of our time have understood its interests and its necessity. Its ostracism since Hippocrates is significant Occidental history which all veterinarians must first comprehend before they can even hope to retrieve the high position they held among the ancient people. The survey must extend beyond the narrow contemporary horizon to overcome the attitude of the masses toward the development of veterinary medicine in our civilization. The present veterinarians are but the struggling hippiators of the ancient Greeks who fought a losing battle during the first eighteen centuries of the Christian Era, only to regain slowly, painfully and incompletely the former status of their innocent and useful art.

As the science of anthropology exhumes more and more the lives of the prehistoric people and the details of their development from tribes to nations, more and more is brought to light about the part played by animal conservation in the destiny of the different human groupings.

Obviously, there is conjecture about man's earliest attempts to protect his animal possessions against disease and to administer

curative treatment but that the wisdom invoked in behalf of animals was the foundation of this civilization is not a debatable question among the thoughtful.

Veterinary medicine is depicted as art often forgotten and even condemned, but one that has carried on in spite of inhibitions (philosophical, religious and political) yet to be overcome to win back the place it once occupied. Facts other historians have dared only to whisper are candidly stated. Plato brought a new doctrine into the world—the doctrine of the soul. The soul sharply separates man from animals and he only is entitled to the benefits of medical science, was Plato's philosophy. Aesculapius treated domestic animals for those who invoked the succor of his art, but Hippocrates and his disciples, concurring with the Platonic philosophy, were less inclined to honor animal medicine.

Thereafter, despite the teachings of a few advocates, little encouraged, veterinary medicine declined to the lowest type of quackery for many centuries from which it has only partly extricated itself. With the coming of Christianity disease became but a visitation of divine wrath and its treatment a divine art. Since then it has traveled "on the margin of human medicine" not within it. Unfortunately for animals, the Asiatics (infidels) worshipped animals as idols, and the Christian dogma was opposed to idols notwithstanding their contributions to human welfare. The philosophy of the 18th century and ever-ravaging animal plagues brought about the resurrection of veterinary medicine from its slumber of centuries but that was not accomplished without difficulty as there were neither doctors nor doctrines to re-edify the people. It required a whole century after the founding of veterinary schools for veterinary medicine to conquer a place in science and society and the attitude toward it has had curious manifestation in different countries.

The book covers veterinary history in two parts: From antiquity to the founding of veterinary schools in the last half of the 18th century and from the latter event until the present time. Part I has three fascinating chapters: Antiquity; the Middle Ages; and the Renaissance. Each has its interesting subdivisions. Chapter I tells of the veterinary services of Asia, Egypt, the Hebrews, Greece, India, Persia and Rome, together with accounts of surgery and medicine, jurisprudence, contagious diseases, and the practice of veterinary medicine in antiquity.

Chapter II, the Middle Ages, brings out the facts about the religious medicine of the period, the achievements of the Moors

(Arabs), plagues of the Middle Ages, and the practice of veterinary medicine by incompetent quacks and sorcerers, tolerated but not encouraged, none of whom could make any progress in the total absence of veterinary schools, or public support of any kind. Here veterinary medicine sank to its lowest level, and with it sank human welfare. In the 13th century, when attempts were being made to revive human medicine which too had sunk to oblivion with the wrecking of the schools and libraries, feeble and entirely unsuccessful attempts were made to revive veterinary medicine. Men of letters who dared to study animal medicine were ostracised from the faculties and gave up in despair, knowing how important it was to check the raging animal plagues around them.

"It was to the Arabs that ancient veterinary medicine flew for refuge" during this strange period of human adventure, lasting from the fifth to the twelfth century of our era. The brilliant universities erected by the Moors at Alexandria, Bagdad, Cardona, Toledo, Seville and elsewhere, sacred in the memory of veterinary science, are described and the remarkable achievements of the Islam nation in animal medicine faithfully reviewed. It was the animal doctors the Arabs left behind and the literature they had compiled and written that left seeds of scientific veterinary medicine implanted among the coming nations of Occidental civilization. "The Arabian authors inscribed brilliant pages in the history of veterinary medicine."

Chapter III describes the inglorious status of veterinary medicine by centuries, from the 13th to the 18th, the latter being the one in which veterinary education was revived, not with human medicine where the ancients placed it, but as an independent enterprise unaided by the medical faculties. Veterinary schools had to found their own doctrine and borrowed little from human medicine. Their precepts were based upon observation, research of their own and the work of the pre-Christian ancients. The animal plagues of the 18th century which turned sensible minds toward animal medicine are described.

Part II is easily the most valuable compilation of facts of our time. It contains, *seriatim*, a description of the veterinary schools and services of each of the modern nations with precision and considerable detail. Here one can make accurate comparisons on the estimation each country of our time places upon the study of veterinary science and its application. It brings out such curious facts as that a small but progressive people like the Japanese have relatively many times more educated veterinarians

than the United States. Each veterinary school of the present time is mentioned and briefly described. It is needless to say that nothing as lucid in that respect was ever published before. On that account, "*Histoire de la Médecine Vétérinaire*" is a complete world's veterinary history. It is politely critical throughout in its treatment of the different countries. France is not spared the criticisms of the author. In fact, all of the failings of the French veterinary service from the beginning to the present moment are pointed out. In reviewing comparatively the veterinary services of the various countries one gets the impression that the Germans have had the most complete and sensible service of all from the time Frederick the Great, not without objections, succeeded in establishing veterinary education in the 18th century until the present day.

Leclainche emphasizes that France made the mistake of passing laws consigning the enforcement of live stock sanitary regulations to the department mayors (state governors) who never ceased to be swayed by local politics. But, in attempting to portray the veterinary situation in the United States, he missed that very point. To Leclainche veterinary medicine is a public service that should be directed by a central command. The present French service, profiting by errors of other days, is now centralized and the local clinicians do much of the work under the direction of regional inspectors. This appears to be the ideal service from the standpoint of economy and efficiency. It corresponds to our still imperfect "accredited veterinarian system."

Chapters II, III and IV, of Part II, contain 35 extremely interesting pages on contagious diseases and the veterinary profession of the 18th to the 20th century.

Having always been in the fields of education and sanitation, it is quite natural that the actual status of the practitioners, who comprise the great majority of veterinarians in most of the countries described, is not specially mentioned. The life, work and rank of those engaged in civil or military services of the different nations is well told but the well being and secular rating of the vast majority who serve the people in a private capacity and cooperate with the sanitarians or army officers whenever called upon, can be judged only by reading between the lines. But, this is hardly a fault of consequence, since practitioners have yet to develop a thirst for the history of their profession as much as their welfare depends upon it.

L. A. M.

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L. A. M.

PREVENTIVE MEDICINE AND HYGIENE. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene, Harvard Medical School. 6th Edition. 1481 pages, with 147 illustrations. D. Appleton—Century Company, New York, 1935. Cloth, \$10.00.

Doctor Rosenau does not need an introduction to members of the veterinary profession, nor is this the first time his book, "Preventive Medicine and Hygiene," has been called to the attention of readers of veterinary literature. He has been engaged in writing concerning the environment of man and its influence on health most of his professional life. He is interested particularly in the relationship of milk to human health and is today one of the most active figures in certified milk circles.

It is universally recognized that this book has always stood at the top and alone as a general reference to matters concerning the public health. The sixth edition strengthens still more this eminent position in the literary field. It has been enlarged and rewritten, so that it embraces all the modern phases of public health activity. Especially noteworthy is the information concerning mental hygiene which is such a vital problem in modern public health.

The veterinarian is most directly interested in the 150 pages devoted to the section on Food. Here Doctor Rosenau discusses in a general way all of the important food problems which may arise. It is very gratifying to see a discussion of meat and the important part the U. S. Bureau of Animal Industry takes in the protection of this food. Public health officials are prone to forget meat and the means taken to protect it unless it is called to their attention in such books as this. The author's long years of interest in the problems arising around milk is reflected in his concise chapter concerning that food. In this chapter are discussed the composition of milk, milk standards, grades of milk, decomposition of milk, milk products, diseases spread by milk and the sanitary control of milk. At the end of the chapter are listed 14 essential requirements for a safe and satisfactory milk supply which everyone should know. In addition to the actual contents of the book, there is a valuable list of references following each chapter.

Anyone interested in general hygiene (air, soil, water) will find the chapters devoted to that subject a great help. Most of the information given is applicable to animal as well as human health. Every professional man, either in human or animal medicine, should have a copy of this book on his desk.

The publishers also are to be complimented on this book. The type is clear and easy to read. Most valuable, however, is the durable binding. It is rare to find a book of 1,500 pages standing the wear and tear of daily use that this one does.

I. A. M.

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Studies on Contagious Pleuro-Pneumonia of Cattle. 1. A Study of the Morphology and Life Cycles of the Organism of Pleuro-Pneumonia Contagiosa Boum (*Borrelomyces Peripneumoniae* Nov. Gen.) by Observation in the Living State under Dark-Ground Illumination. A. W. Turner. Reprint from *Jour. Path. & Bact.*, xli (1935), pp. 32.



ABSTRACTS

THE VISCERAL LESIONS PRODUCED IN MICE BY THE SALIVARY GLAND VIRUS OF MICE. Howard A. McCordock and Margaret G. Smith. Jour. Exp. Med., lxiii (1936), 3, p. 303.

Extensive visceral lesions containing intranuclear inclusions have been produced in mice by intraperitoneal and intracerebral inoculation of the homologous salivary gland virus. Rarely small pancreatic lesions containing inclusions have been encountered two weeks after subcutaneous inoculation. Many of the animals injected intraperitoneally died between the fourth and seventh days after inoculation. In spite of the extensive lesions produced in the liver and spleen, the virus could not be transferred with an emulsion of these organs.

ACTIVE IMMUNIZATION OF GUINEA PIGS WITH THE VIRUS OF EQUINE ENCEPHALOMYELITIS. I. Quantitative experiments with various preparations of active virus. Peter K. Olitsky and Herald R. Cox. Jour. Exp. Med., lxiii (1936), 3, p. 311.

Active eastern and western equine encephalomyelitis virus in three forms, (1) chemically untreated but simply passaged through a series of mice, (2) adsorbed on alumina Gel C, and (3) precipitated by tannin, yielded practically the same results when employed for the immunization of guinea pigs. The virus is not inactivated by the process of adsorption or precipitation. There is no difference in the rate of absorption *in vivo* of the chemically treated and untreated virus preparations. After storage of the three immunizing preparations (2 to 3 months passaged and precipitated material, 6 months adsorbed material), each was found to contain an amount of virus sufficient to produce immunity in animals against the usual intracerebral test inoculation.

The protection afforded by the three preparations is apparently durable. The amount of the virus necessary to confer protection may be defined as that which immunizes with the least number of antigenic units and with the minimum febrile re-

action and blood infection. The subcutaneous injection of one or two doses of the virus preparation in the guinea pig brings about protection regularly against experimental infection by way of the nose or subcutis. By three injections resistance is obtained against 10^3 to 10^4 lethal doses given intracerebrally. A quantitative basis has been established for immunizing capacities of preparations employed in experimental equine encephalomyelitis in guinea pigs.

STUDIES ON THE ETIOLOGY OF RABBIT-POX. III. Tests on the relation of rabbit-pox virus to other viruses by crossed inoculation and exposure experiments. Ch'uan-K'uei Hu, Paul D. Rosahn and Louise Pearce. *Jour. Exp. Med.*, lxiii (1936), 3, p. 353.

Rabbits which recover from spontaneous or experimental rabbit-pox are refractory to inoculations of pox virus injected by different routes. Pox-recovered rabbits were susceptible to inoculation with the virus of virus III disease of rabbits and virus III-recovered rabbits could be successfully inoculated with pox virus. Rabbits recovered from experimental or spontaneous pox were found to be just as susceptible to inoculation with the virus of infectious myxoma of rabbits as were normal rabbits.

Experimental and spontaneous pox-recovered rabbits were refractory to inoculation with culture dermovaccine virus but vaccine-recovered rabbits were not completely refractory to inoculation with pox virus. Experimental pox-recovered rabbits were partially refractory to inoculation with neurovaccine virus and neurovaccine-recovered rabbits were practically refractory to inoculation with pox virus. The cutaneous lesions which developed from the intradermal injection of pox, neurovaccine, and culture vaccine viruses showed definite differences with respect to the rate and persistence of active growth, amount of edema, hemorrhage, necrosis and the degree of tissue destructiveness. A close relation exists between pox virus on one hand and vaccine virus and neurovaccine virus on the other; they are not identical in all respects.

STUDIES ON THE ETIOLOGY OF RABBIT-POX. IV. Tests on the relation of rabbit-pox virus to other viruses by serum neutralization experiments. Ch'uan-K'uei Hu, Paul D. Rosahn and Louise Pearce. *Jour. Exp. Med.*, lxiii (1936), 3, p. 379.

The finding that pox virus is neutralized by pox-immune serum indicates that the refractory state of recovered pox rabbits to

reinoculation with pox virus and the failure of recovered pox rabbits to contract a second pox infection after adequate exposure is to be explained upon the basis of an active immunity. The failure of virus III immune serum to neutralize pox virus is in agreement with the previous conclusion that there is no specific relationship between these viruses. Rabbits which had recovered from a pox infection were completely refractory to dermiovaccine virus, while rabbits which had recovered from vaccinia were partially refractory to pox virus. The serum neutralization tests showed that pox immune serum neutralized vaccine virus, although the action was not complete. The differences in neutralizing ability on the part of the three immune sera paralleled the differences in virus potency, as indicated by the general character of the local lesions at the site of injection. From a practical standpoint vaccination with vaccine virus as a prophylactic measure against rabbit-pox was clearly indicated.

STUDIES ON PSEUDORABIES (INFECTIOUS BULBAR PARALYSIS, MAD ITCH). III. The disease in the rhesus monkey, *Macaca mulatta*. Weston E. Hurst. *Jour. Exp. Med.*, lxxiii (1936), 3, p. 449.

In the monkey the virus of pseudorabies, pantropic in the rabbit, behaves as a strict neurotrope. Infection, usually fatal, readily follows intracerebral and intracisternal inoculation of rabbit virus, and often intrasciatic inoculation. In a limited number of experiments no infection resulted from intradermal, intramuscular or intravenous inoculation. Nerve and glial cells and certain cortical areas showed more evidence of susceptibility than other nerve tissue. Other areas of the nervous system are relatively insusceptible to the action of the virus. The blood and cerebral fluid play no apparent rôle in disseminating the virus which, after intrasciatic inoculation, spreads upward by the nervous path. The sera of six out of 26 monkeys were found to contain antibodies neutralizing B virus; these six monkeys were all included in one batch of seven received at one time from the dealer.

THE SIZES OF THE VIRUSES OF HUMAN AND SWINE INFLUENZA AS DETERMINED BY ULTRAFILTRATION. W. J. Elford, C. H. Andrews and F. F. Tang. *Brit. Jour. Exp. Path.*, xv (1936), 1, p. 51.

The end point for each of these strains of influenza virus may be taken as 0.16 microns from which, on the basis of the rela-

tionship between limiting porosity and particle size established by Elford, the probable size of the virus particles is between 80 and 120 millimicrons. The virus of influenza is somewhat smaller than the viruses of vaccinia and herpes.

CULTURAL REQUIREMENTS OF THE FOWL-CORYZA BACILLUS. O. W. Schalm and J. R. Beach. Jour. Bact., xxxi (1936), 2, p. 161.

Twelve different cultures of the fowl-coryza bacillus, representing strains from three states, varied in their period of cultivation on artificial media for from four to 157 transfers made every four days. Regardless of strain or age, all cultures of this microorganism required the presence of both the X and the V factors for growth on or in an artificial medium. On this basis the fowl-coryza bacillus is to be classed in the genus *Hemophilus*. The name *Bacillus haemoglobinophilus-coryza-gallinarum*, suggested by DeBlieck, describes the organism satisfactorily. However, *Hemophilus gallinarum*, proposed by Eliot and Lewis, is better suited, due to its shortness.

THE ROLE OF BACTERIA IN AUTOLYZING TISSUE. James R. Reeves and Hugh E. Martin. Jour. Bact., xxxi (1936), 2, p. 191.

Most experiments on the subject of tissue autolysis have not given proper consideration to the possible presence of bacteria in the digests. Autolyzing digests of hog and beef liver obtained fresh from the slaughter-house have been shown to contain highly resistant strains of spore-forming bacteria. Alterations in pH and the use of antiseptics as preservatives have failed to prevent the growth of bacteria in most of the autolyzing preparations studied. Sterility of the digest could be determined only by bacterial smears and cultures. Anaerobic spore-forming bacilli have been found repeatedly growing in digests which were free from putrid odors and showed no gross evidence of bacterial growth.

STUDIES ON THE BACTERICIDAL ACTION OF BOVINE WHOLE BLOOD AND SERUM TOWARDS BRUCELLA ABORTUS AND BRUCELLA SUI. M. R. Irwin, B. A. Beach and F. N. Bell. Jour. Inf. Dis., lviii (1936), 1, p. 15.

Bovine whole blood and serum contain bactericidins for *Bruceella abortus*. Whole blood shows a bactericidal effect slightly less than comparable amounts of serum alone. Individual ani-

mals show uniformity in reaction at different times with a difference between animals in bactericidin activity. Certain animals recovered from a previous infection of *Br. abortus* showed a loss in bactericidal properties of the whole blood as compared with that of presumably normal animals. Bovine whole blood exerted no bactericidal effect on *Br. suis*. The reaction of serum for this organism was decidedly less marked than for *Br. abortus*.

STUDIES ON THE EXTRACTION OF A PRECIPITABLE SUBSTANCE FROM THE GENUS BRUCELLA. Dorothy O. Reiter. Jour. Inf. Dis., lviii (1936), 1, p. 45.

Specific precipitable substances of polysaccharide nature were prepared from the three varieties of the genus *Brucella* by saline extraction followed by precipitation with alcohol. These substances were feebly antigenic in rabbits, but failed to give any of the usual chemical tests for proteins with the exception that under certain conditions the substance from strain A 456 and S 41-1 gave a doubtfully positive biuret test. The specific substance from the abortus strain caused a typical anaphalactic reaction in a guinea pig when 15 mg was used as a sensitizing dose. The specific substance from the melitensis and the porcine strains failed to give a typical reaction. The preparations from the three varieties precipitated *Brucella* antisera but did not precipitate heterologous sera from the *Salmonella* group. Sera absorbed with the precipitable substances from the three varieties showed considerable reduction in the agglutinating titre of both homologous and heterologous *Brucella* antisera, indicating that the differences observed in the specific precipitable substances from the three strains may be quantitative rather than qualitative.

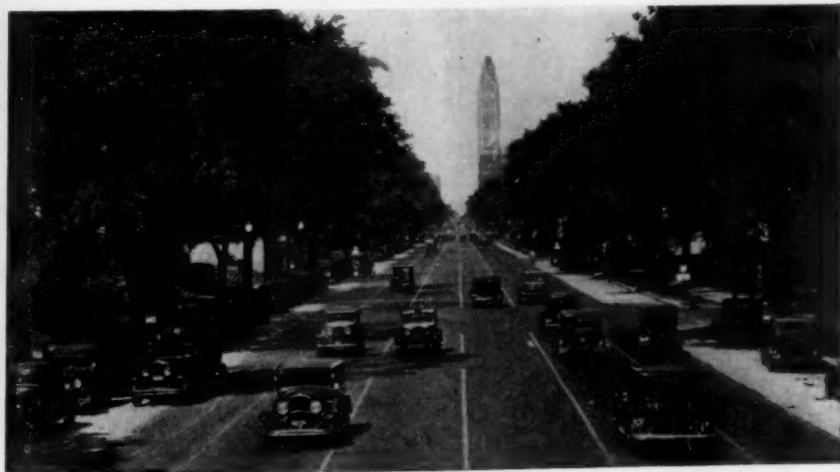
STUDIES ON INFLAMMATION. XI. Invasiveness and virulence in relation to resistance. Vally Menkin. Jour. Inf. Dis., lviii (1936), 1, p. 81.

The inoculation of a culture of *Staphylococcus aureus*, or aleuronat, or turpentine, into a skin area into which virulent type III pneumococci have been injected, is accompanied by an increase in the survival time of rabbits. The increase in resistance thus manifested is due to a delay in the spread of the pneumococci from the site of their inoculation and this is referable in turn to early mechanical obstruction by thrombosed lymphatics and coagulated plasma in the inflamed area. The presence of such a barrier in the experiment animals has been

correlated both with the inability of a dye to diffuse readily into the regional lymphatics from the site of inflammation and by studies on the presence of pneumococci from the blood-stream. The observations indicate that the rapidity of the invasion of a microorganism, as modified by the local inflammatory reaction, is a significant factor in determining the resistance or immunity of the host, but induced alterations in the rate of dissemination may leave the virulence of the bacteria essentially unaffected.

THE DESTRUCTION OF THE TUBERCLE BACILLI WITHIN PHAGOCYTES IN VITRO. J. B. Clawson. Jour. Inf. Dis., lviii (1936), 1, p. 64.

Tubercle bacilli undergo lysis *in vitro* after being phagocytosed by normal mononuclear leukocytes in the presence of immune serum. The lysis is greatly accelerated in the presence of immune serum and the degree of lysis tends to correlate the concentration of antibodies in the immune serum. The mononuclear leukocytes of immune and allergic animals, when washed free from serum, appear to be no more sensitive in bringing about lysis than normal leukocytes. The degree of lytic action of the serum appears to bear no necessary relation to the allergic state in the animals from which the serums were taken. Lysis of tubercle bacilli phagocytosed by mononuclear leukocytes is a probable method of destroying the organisms in the tuberculous infected body.



EAST BROAD STREET, COLUMBUS



Reineccius, Jake Louis.....1st Lt...1911 E. 6th St., Duluth, Minn.
Richey, Alfred Newton.....1st Lt...Lanesboro, Iowa.
Woods, Harry Milford.....1st Lt...1102 State Office Bldg., Richmond,
Va.

NEW ASSIGNMENTS TO ACTIVE DUTY WITH CCC

Burke, Edward J.....1st Lt...Fort Williams, Me.
Lancaster, Harry R.....1st Lt...Fort McClellan, Ala.

TERMINATION OF ASSIGNMENT TO ACTIVE DUTY

Hoyt, Kenneth R.....1st Lt...Seattle Q. M. Depot (disability).
Leach, Benjamin F.....1st Lt...Fort Williams, Me.

Notice of Examination for Appointments in the Veterinary Corps, Regular Army

The War Department has announced a competitive examination, July 6-11, 1936, inclusive, for the purpose of qualifying doctors of veterinary medicine for appointment as First Lieutenants, Veterinary Corps, to fill existing and anticipated vacancies during the fiscal year 1937.

Applicant must be a male citizen of the United States between the ages of 23 and 32 years, and a graduate of a recognized veterinary college.

BUREAU TRANSFERS

DR. PERCY M. ALDRICH (Wash. '32), from Chicago, Ill., to Huron, S. Dak., on meat inspection.

DR. ROBERT THUMANN (Cin. '12), from Fostoria, Ohio, to Columbus, Ohio, in charge of virus-serum control.

DR. C. R. PALMER (K. C. V. C. '16), from Tempe, Ariz., to Sacramento, Calif., on tuberculosis eradication.

DR. CHAS. M. CHASE (Colo. '19), from Denver, Colo., to Anderson, Ind., in charge of meat inspection.

DR. DAVID S. KAY (San Fran. '11), from Seattle, Wash., to Los Angeles, Calif., on meat inspection.

DR. JOSEPH A. MEHAN (U. P. '28), from Philadelphia, Pa., to Scranton, Pa., on meat inspection.

DR. JOHN WELNHOFER (Iowa '30), from South Saint Paul, Minn., to Seattle, Wash., on meat inspection.

DR. EDWARD LAPPLE (Cin. '11), from South Saint Paul, Minn., to Sioux City, Iowa, on virus-serum control.

DR. J. S. JENISON (McK. '07), from Kansas City, Kan., to Chicago, Ill., in charge of meat inspection.

DR. EDWARD D. KENNEDY (K. C. V. C. '06), from Los Angeles, Calif., to Baltimore, Md., in charge of meat inspection.

DR. EDWARD F. CARY (K. C. V. C. '09), from Wichita, Kan., to Los Angeles, Calif., on charge of meat inspection.

DR. O. E. HERL (O. S. U. '16), from Kansas City, Kan., to Columbus, Ohio, on virus-serum control.

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of the Seventy-Second Annual Meeting,
Oklahoma City, Okla., August 27 to 30, 1935

Section on General Practice

TUESDAY AFTERNOON, AUGUST 27, 1935

The first session of the Section on General Practice convened at 3 p. m., Dr. Wm. H. Ivens, chairman of the Section, presiding. In the absence of Dr. James M. Bryan, secretary of the Section, Dr. C. H. Case, of Akron, Ohio, was appointed to act as Secretary *pro tem*.

* * * *

The following program was presented:

"Reproductive Hormone Therapy in Domestic Animals," Drs. G. H. Hart and H. H. Cole. (Read by Dr. W. R. Hinshaw.)

"Artificial Insemination in Cattle," Dr. H. E. Kingman.

"Sterility in Cows," Dr. C. H. Case.

. . . The session adjourned at 5:20 p. m. . . .

ADJOURNMENT

WEDNESDAY AFTERNOON, AUGUST 28, 1935

The second session convened at 1:50 p. m., Dr. Ivens, chairman of the Section, presiding.

* * * *

The following program was presented:

"Periodic Ophthalmia," Dr. C. J. Marshall.

"X-Rays as a Diagnostic Aid in Veterinary Science," Lt. George Townley Price, V. C., U. S. A.

"Swine Erysipelas," Dr. T. W. Munce.

"Staphylococci Associated with Mastitis," Drs. Ralph B. Little and Edward J. Foley. (Read by Dr. J. G. Hardenbergh.)

. . . The session adjourned at 3:15 p. m. . . .

ADJOURNMENT

Section on Research

TUESDAY AFTERNOON, AUGUST 27, 1935

The first session of the Section on Research convened at 3 p. m. In the absence of Dr. E. A. Watson, chairman of the Section, Dr. L. Enos Day, of Chicago, presided and Dr. B. T. Simms acted as Secretary.

The following program was presented:

"A Study of the Channels of Brucella Infection in Bulls," Dr. A. L. Delez. (Read by title.)

"Studies on the Epidemiology of Pseudorabies," Dr. Richard E. Shope.

"Immunization Against Virus Diseases with Tissue Vaccine," Dr. Wm. H. Boynton.

"The Evaluation of Canine Distemper Virus and Antiserum," Dr. N. J. Pyle.

. . . The session adjourned at 4:55 p. m. . . .

ADJOURNMENT

Section on Research and Section on Poultry

WEDNESDAY AFTERNOON, AUGUST 28, 1935

The joint session of the Section on Research and the Section on Poultry convened at 2:40 p. m. Dr. A. J. Durant, of Columbia, Mo., presided.

* * * *

The following program was presented:

"Hemocytoblastosis and Its Relation to the Development of Fowl Paralysis and Fowl Leukemia," Dr. M. W. Emmel.

"Fowl Leukosis," Dr. F. D. Patterson.

"Lymphocytoma and Fowl Paralysis," Dr. R. Fenstermacher.

"Studies on Bovine Mastitis," Dr. L. E. Starr, T. H. Prescott and Jane Huffman. (Read by Dr. Starr.)

"Supplementing Soil with Iron and Copper for the Prevention of Anemia in Young Pigs," Dr. L. H. Moe, W. A. Craft and C. P. Thompson. (Read by Dr. Moe.)

. . . The session adjourned at 5:18 p. m. . . .

ADJOURNMENT

Section on Poultry

THURSDAY MORNING, AUGUST 29, 1935

The second session of the Section on Poultry convened at 9:40 a. m., Dr. A. J. Durant, of Columbia, Mo., presiding in the absence of Dr. E. L. Brunett, chairman of the Section.

* * * *

The following program was presented:

"An Outbreak of Acute Swine Erysipelas Infection in Turkeys," Dr. F. R. Beaudette and C. B. Hudson. (Read by Dr. Beaudette.)

"Observations on Pendulous Crop in Turkeys," Dr. W. R. Hinshaw and V. S. Asmundson. (Read by Dr. Hinshaw.)

"Studies on the Egg-Propagated Viruses of Infectious Laryngotracheitis and Fowl-Pox," Dr. C. A. Brandly.

. . . The session adjourned at 11:30 a. m. . . .

ADJOURNMENT

(To be continued.)

Resume of Minutes of Meeting of Executive Board, Oklahoma City, Okla., August 26-28, 1935

The annual meeting of the Executive Board of the American Veterinary Medical Association was held in Parlor G of the Skirvin Hotel, Oklahoma City, Okla., Monday afternoon, August 26, 1935, at 2:15 p. m. Dr. Cassius Way, Chairman, presided.

1. Roll-call showed the following to be present: Dr. Cassius Way, New York, N. Y., Chairman and Member-at-Large; Dr. A. E. Cameron, Ottawa, Ontario, District 1; Dr. L. A. Merillat, Chicago, Ill., District 3; Dr. A. A. Husman, Raleigh, N. Car., representing District 4 in place of Dr. W. W. Dimock; Dr. F. F. Parker, Des Moines, Iowa, District 5; Dr. L. M. Hurt, Los Angeles, Calif., District 6; Dr. C. H. Hays, Pierre, S. Dak., District 7; Dr. J. C. Flynn, Kansas City, Mo., District 8; Dr. O. V. Brumley, Columbus, Ohio, District 10; Dr. R. S. MacKellar, New York, N. Y., ex officio; Dr. M. Jacob, Knoxville, Tenn., Treasurer; Mr. Joseph M. Kotz, Chicago, Ill., legal counsel; Dr. H. Preston Hoskins, Chicago, Ill., Secretary.

Absent: Dr. E. P. Althouse, Sunbury, Pa., District 2; Dr. H. W. Jakeman, Boston, Mass., District 9; Dr. C. P. Fitch, Saint Paul, Minn., ex officio.

2. The minutes of the special meeting of the Board, held in December, 1934, were approved. (Résumé published in JOURNAL, August, 1935.)

3. Treasurer Jacob presented a financial statement covering the period from January 1, 1935, to July 31, 1935. (Published in JOURNAL, October, 1935.) He reported that the East Tennessee National Bank was operating but that the A. V. M. A. had not received any dividends to date. He further reported that the case involving the recovery of the bonds belonging to the Salmon Memorial Fund was expected to come up some time during September or October.

4. For the Special Committee on NRA, Dr. Flynn reported that there had been no recent activities and recommended that the Committee be discharged. Recommendation approved.

5. For the Special Committee on Publications, Dr. Brumley reported that a survey indicated a need for new textbooks in practically every branch of the veterinary profession. Report approved and Committee continued.

6. For the Special Committee on the Merillat-Campbell book, "Veterinary Military History of the United States," Dr. Hoskins presented a report recommending that the A. V. M. A. purchase 200 copies of the book from the publishers at ten dollars per copy, at a total cost of \$2,000.00, and that these be distributed with the compliments of the A. V. M. A. to libraries and institutions, these to be selected by a special committee appointed for that purpose. Report approved.

7. The Board approved the proposed amendment providing for the creation of a standing committee to be known as the Committee on Public Relations.

8. The Board disapproved the proposed amendment providing for the admission into active membership of others than veterinarians.

9. The Board approved the proposed amendment providing for the President acting as chairman of the House of Representatives.

10. The Board approved the proposed amendment providing for the election of a president-elect one year in advance of his taking office as president.

11. The Board disapproved the proposed amendment providing for nominations for the office of president being made by the House of Representatives.

12. The Board disapproved the proposed amendment providing for the election of president by mail ballot.

13. The Board adopted a motion to have a special committee study the Constitution and By-Laws, following final action on the various proposed amendments, and make recommendations for further changes, if such appear to be desirable, to secure better functioning of all parts of the A. V. M. A.

14. The Board took favorable action on six applications for membership referred to it by the Secretary. (The applicants were graduates of colleges not recognized by the A. V. M. A. at the time of their graduation.)

15. The Board accepted the resignation of 21 members.

16. The Board voted to discontinue the Section on Military Medicine.

17. The Board authorized the appointment of a special committee to study the report on "Centralization of Activities of Veterinary Examining Boards," the committee to report at the December meeting. (Committee appointed: Dr. L. M. Hurt, Chairman; Dr. O. V. Brumley and Dr. C. H. Hays.)

18. The Board took favorable action on the nomination of Major General Charles Ranson Reynolds for honorary membership in the A. V. M. A.

19. The Board received and recommended for approval the report of the Secretary-Editor, presented by Dr. Hoskins.

20. The Board considered invitations for having the A. V. M. A. represented at meetings of various organizations.

21. The Board took no action on the proposal to increase the annual dues.

22. The Secretary reported the need for a new edition of the A. V. M. A. Membership Directory, but he recommended against the publication of a new edition at this time, for the reason that hundreds of members engaged in the several governmental control projects are changing locations frequently and a directory is soon out of date under these conditions.

23. The Secretary reported on the activities of the Student Loan Fund of the Women's Auxiliary, the details of which are now handled in the A. V. M. A. office.

24. The Board approved a recommendation that Mr. Joseph M. Kotz be retained as legal counsel for the Association, for another year, beginning September 1, 1935.

25. Dr. C. D. Carpenter, secretary of the California State Veterinary Medical Association, accompanied by Dr. Oscar J. Kron, president of the Association, appeared before the Board and reported on the veterinary exhibit at the California Pacific International Exposition. Dr. Carpenter thanked the A. V. M. A. for the financial support that had already been given and indicated that additional funds probably would be needed to take care of transportation charges on the exhibits when these were returned to the various exhibitors following the close of the Exposition. The Board recommended to the Committee on Budget that an item of \$300.00 for publicity be included in the budget for the coming year.

26. The Board authorized the reimbursement of members of the Board for their expenses incurred in attending this meeting, in those cases where these expenses were not otherwise taken care of.

The meeting adjourned at 6:30 p. m.

SECOND SESSION

The Board met again on Wednesday afternoon, August 28, at 4:25 p. m. The roll-call showed the same members and officers present who were in attendance at the meeting on Monday.

27. Dr. E. E. Wegner, of Pullman, Wash., appeared before the Board for the purpose of presenting certain facts in connection with the invitation that had been extended the A. V. M. A. to meet in Seattle in 1937. Dr. B. T. Simms, of Corvallis, Ore., followed Dr. Wegner, on the same subject.

28. Dr. C. D. Carpenter, secretary of the California State Veterinary Medical Association, again appeared before the Board, and presented the portrait of President R. S. MacKellar, the work of Mrs. Carpenter. Dr. Carpenter stated that the portrait of Dr. C. P. Fitch had not been done, as it had not been possible for Dr. Fitch to have a sitting.

29. Dr. Carpenter also reported that the California delegate to the House of Representatives had been instructed to invite the A. V. M. A. to meet in San Francisco in 1938, on the occasion of the completion of the San Francisco-Oakland and Golden Gate bridges.

30. Dr. Way reported for the special committee that had been appointed to study the recommendations contained in a communication that had been addressed to the members of the Executive Board by Dr. R. J. Garbutt.

31. Dr. Way then reported for the special committee that had been appointed to investigate and study the question of employing an assistant to the Secretary-Editor.

32. The Secretary reported that volume I of the Proceedings of the Twelfth International Veterinary Congress had already been distributed, and that Dr. Mohler had advised him that volume II would be ready shortly, and that volume III would be ready soon after volume II.

33. Dr. Way was reelected chairman of the Executive Board for the ensuing year.

34. The Board then voted to recommend the reappointment of Dr. Hoskins as Secretary-Editor for the year beginning January 1, 1936.

35. The Board authorized Dr. J. C. Flynn and Dr. A. A. Husman to represent the Board at the counting of the election ballots.

The meeting adjourned at 6:00 p. m.

H. PRESTON HOSKINS, *Secretary*.

Financial Report

JANUARY 1, 1935, TO DECEMBER 31, 1935

Bank balance, December 31, 1934 (Overdraft)..... (\$ 1,000.64)

Receipts for Calendar Year

Received from Secretary.....\$31,631.67

Interest on Government Bonds:

A. V. M. A. Fund.....\$ 1,413.97

JOURNAL Fund 143.42

1,557.39

Total receipts 33,189.06

\$32,188.42

Disbursements for Calendar Year

A V. M. A. Fund.....\$13,284.17

JOURNAL Fund 16,110.65

Total disbursements 29,394.82

Bank balance, December 31, 1935..... \$ 2,793.60

Revolving Fund in hands of Dr. Hoskins..... 500.00

Total cash resources..... \$ 3,293.60

U. S. Government Bonds (\$41,000.00 par value) at cost... 41,259.02

Due from Salmon Memorial Fund..... 400.00

Balance of claim, Trustees East Tennessee National Bank.. 1,333.02

Total assets December 31, 1935..... \$46,285.64

Total assets December 31, 1934..... 42,491.40

Increase in assets for year..... \$ 3,794.24

DISTRIBUTION OF ASSETS

<i>Fund</i>	<i>Cash</i>	<i>Bonds at Cost</i>	<i>Due from Salmon Memorial Fund</i>	<i>Claim Against Closed Bank</i>	<i>Total</i>
A. V. M. A... (\$15,182.85)	\$ 5,821.94	\$400.00	\$ 418.00	(\$ 8,542.91)	
JOURNAL	18,476.45	35,437.08	915.02	54,828.55
Totals	\$ 3,293.60	\$41,259.02	\$400.00	\$1,333.02	\$46,285.64

Respectfully submitted,

(Signed) M. JACOB, *Treasurer*.

WE HEREBY CERTIFY that we have audited the books of the American Veterinary Medical Association and that the above statement is true and correct to the best of our knowledge and belief.

DAHLBERG & COMANY.

(Signed) B. I. DAHLBERG.

Erratum

In the proceedings of the Oklahoma City Convention, as published in the October, 1935, issue of the JOURNAL, the first resolution in the report of the Committee on Resolutions (page 470) was incorrectly printed, one paragraph having been inadvertently omitted in the transcribing of the minutes. The correct form of the resolution is as follows:

RESOLUTION 1

WHEREAS, Rabies is a menace to the public health and to the live stock industry in many parts of America, and

WHEREAS, Dogs act as the principal reservoirs and spreaders of this infection, and

WHEREAS, A number of years of field experience has demonstrated the efficiency of prophylactic vaccination against rabies when administered by qualified veterinarians, and

WHEREAS, The results of research work dealing with this subject indicate efficiency for rabies prophylactic vaccine; therefore, be it

Resolved, That the American Veterinary Medical Association endorses and recommends the annual prophylactic vaccination of dogs in those areas where rabies is known to exist, and be it further

Resolved, That this Association recommends, however, the continuance of employment of proper sanitary police measures, combined with vaccination by qualified veterinarians, in combating and controlling rabies, and therefore, be it further

Resolved, That this Association condemns the practice of distributing rabies vaccine for use by unqualified persons.

Professor Matsuba Visits Chicago

Prof. Dr. Shigeo Matsuba, member of the Faculty of Agriculture of Tokyo Imperial University, Tokyo, Japan, was a Chicago visitor on April 10. He included the A. V. M. A. office and the stock yards in his itinerary while in the Windy City.

Ohio 1936 Year-Book

The 1936 Year-Book of the Ohio State Veterinary Medical Association has made its appearance. It contains the proceedings of the 1936 annual meeting, with all papers presented on that occasion. Much other interesting information is to be found in the book, including a list of the members of the Association. This list is marked to show which members are also members of the American Veterinary Medical Association. Then there is a list of the active, registered veterinarians of Ohio, arranged geographically by counties, and this list also shows which veterinarians are members of the state and national organizations. The material in the Year-Book was compiled by Dr. R. E. Rebrasier, secretary of the Ohio State Veterinary Medical Association.

TWELFTH INTERNATIONAL VETERINARY CONGRESS

Report of Finance Committee

A meeting of the Finance Committee, appointed at the closing session of the Twelfth International Veterinary Congress, for the purpose of closing the accounts and issuing a statement in connection therewith, was held at the Rockefeller Plaza, New York City, on the afternoon of April 15, 1936. There were present Dr. R. S. MacKellar (in the chair), Dr. Adolph Eichhorn and Dr. C. J. Marshall, members, and Dr. John R. Mohler and Col. O. E. McKim, invited guests.

The Treasurer submitted a statement of the receipts and expenditures of the Congress, which had been audited by Stuart Heitmuller, public accountant and auditor, of Washington, D. C. This statement and the auditor's report were examined, approved and ordered to be published in accordance with the statutes of the Congress. The question of the disposal of the balance left in this fund was deferred for consideration at the evening meeting of the Committee.

The Treasurer's letter of April 14, and the auditor's certified statement of the receipts and expenditures are attached.

(Signed) R. S. MACKELLAR, *Chairman*

(Signed) C. J. MARSHALL

(Signed) ADOLPH EICHHORN, *Secretary*

New York, N. Y., April 15, 1936.

Letter of Transmittal of Report of Treasurer

Finance Committee,

Twelfth International Veterinary Congress,

Dr. R. S. MacKellar, Sr., Chairman,

Dr. A. Eichhorn,

Dr. C. J. Marshall.

Gentlemen:

I respectfully present herewith the report of the Treasurer of the Twelfth International Veterinary Congress, held in New York, Aug. 13-18, 1934. In this connection the by-laws state that the accounts of the Congress must be closed "not later than two years after the final meeting." Such action might have been

accomplished several months earlier, but it was retarded on account of the delay in obtaining from the Government Printing Office the last bill for reprints of papers presented at the Congress, which bill was received only a few days ago.

Attention is called also to the by-laws which specify that the revenues of each Congress shall consist of:

- (a) Subscriptions of members.
- (b) Voluntary contributions, etc.

Although the latter (b) are not subject to the statutes of the by-laws "unless the donors have made the contrary a condition of their gifts" (which condition was not requested by any donor), nevertheless it is recommended that the attached balance sheet, which contains a statement of receipts and expenses in full, be furnished for publication in the veterinary journals of those countries having the largest number of members of the Twelfth International Veterinary Congress.

As you will note, the Treasurer's report shows that the budget has been balanced and a respectable surplus attained for further use in advancing the outposts of our profession.

You will further note the receipts from membership dues, the only funds over which the by-laws have specific jurisdiction, were insufficient to meet the demands of the Congress *per se*, but fortunately the various contributions, combined with the Government printing appropriation, were sufficient not only to make up the deficit, but also to leave the respectable balance reported.

Respectfully submitted,

(Signed) J. R. MOHLER, *Treasurer*.

Washington, D. C., April 14, 1936.

Report of Treasurer

CASH RECEIPTS AND EXPENDITURES

PERIOD MAY 28, 1931, TO APRIL 13, 1936

Cash Receipts

Membership fees (including ladies and students) ..	\$17,279.51
Veterinary associations	12,445.60
Honor Roll contributions.....	2,800.00
Other contributions	5,919.64
Sale of Proceedings.....	405.29
Sale of reprints.....	257.53
Alumni and General banquets.....	2,855.50
Commercial exhibits	4,289.50
Interest on bank deposits.....	.95
Total receipts	\$46,253.52*

Cash Expenditures

Organizing Committee expense.....	\$ 1,335.74
Local Arrangements Committee expense.....	426.14
Publicity Committee expense.....	250.04
Expenses to Permanent Committee Meeting in Paris	300.00
Donation to Permanent Committee Administration	1,000.00
Membership badges	653.40
General Secretary's office expense, Chicago, Ill....	955.39
General Secretary's office expense to, from and in New York City	608.99
Assistant to the General Secretary (Mr. Haux)...	2,376.00
Official photographer	151.00
Advertising expenses	537.26
Postage on circular letters.....	139.52
Job printing and stationery.....	1,305.59
Protested and returned checks.....	285.00
Bank charges	8.75
Public accountant's fee.....	50.00
Post-Congress Clinic	375.08
Translating, interpreting and editing.....	984.57
Printing of Proceedings.....	9,458.21
Printing of reprints.....	920.53
Decorations of commercial exhibits.....	420.00
Waldorf-Astoria (receptions, banquets and inci- dentals)	8,362.13
Music, entertainment and incidentals at recep- tions, luncheons and banquets.....	1,766.25
Boat excursions, Playland, New York harbor, etc.	600.00
Ladies' and children's entertainment.....	1,287.40
Motor transportation to West Point, Playland, Princeton and points of interest.....	1,562.69
Total expenditures	\$36,119.68
Excess of cash receipts over expenditures.....	\$10,133.84

STATEMENT OF AUDITOR

I certify that the above is a true and complete statement of the cash receipts and cash expenditures as submitted of the Twelfth International Veterinary Congress for the period of May 28, 1931, to and including April 13, 1936.

(Signed) STUART P. HEITMULLER, *Accountant and Auditor*
April 14, 1936.

*An additional \$11,000 was appropriated and spent by the United States Government for setting type, general proof-reading, corrections, engravings, and printing and binding of a sufficient number of copies of the Proceedings for free distribution to various libraries and other depositories approved by the Congress of the United States. This fund was handled directly by the fiscal agents of the Government.

Further Report of Finance Committee

The Committee on Finance of the Twelfth International Veterinary Congress met again on the evening of April 15, at the Waldorf-Astoria, New York City, after having previously examined the financial, audited report of Dr. John R. Mohler, treasurer of the Congress, and approving the same.

The Committee at this time deemed it advisable to consider the utilization of the unexpended balance and, after full discussion, has unanimously decided to allocate the same for the following purposes:

1. A \$5,000 endowment, to be created and placed in the custody of the Treasurer of the American Veterinary Medical Association, the annual income of which is to be awarded as the Twelfth International Veterinary Congress Prize to a member of the A. V. M. A. for the most noteworthy contribution to the advancement of veterinary science during the preceding year. This cash Prize is to be awarded only to veterinarians and presented at the annual meeting of the A. V. M. A., beginning in 1937, but is not to be given more than once to any recipient. The body to make the annual award shall consist of a special committee of five, constituted as follows: President of the A. V. M. A., Chairman of the Executive Board of the A. V. M. A., Chief of the Bureau of Animal Industry, and Chief of Veterinary Division of Surgeon General's Office, U. S. Army, these four members to select the fifth member who shall not succeed himself.

2. A \$3,000 endowment, to be created and placed in the custody of the Treasurer of the A. V. M. A., the income during the intervals of the International Veterinary Congresses to accumulate and the accumulated sum to be awarded as a cash prize, to be known as the U. S. A. Twelfth International Veterinary Congress Prize, at each International Veterinary Congress, for the most noteworthy contribution made by a veterinarian in the advancement of veterinary science since the last preceding Congress. The members of the Permanent Committee should constitute the body to award this Prize. At the meeting at which the program for the forthcoming International Veterinary Congress is considered, proposals for the candidates for the Prize should be made and, at a meeting during the Congress, the Permanent Committee should decide on the winner and the President make the presentation at the closing session of the Congress.

3. The balance of the surplus should be utilized as follows:

Dr. Mohler, who extended the official invitation to the Congress at the Eleventh International Veterinary Congress at London, to receive \$511 as part of his personal expenses incurred on that trip.

An appropriation of \$400 to be made towards the expenses of a Permanent Committee member from the United States to attend the meeting of the Permanent Committee in Paris in 1937. At this meeting, the program for the Thirteenth Congress is to be considered. Should the President of the Twelfth International Veterinary Congress not be in a position to attend, he should be given the privilege of naming an alternate to attend said meeting.

An appropriation of \$400 to be made to each of the three members of the Permanent Committee from the United States to attend the Thirteenth International Veterinary Congress at Berne, Switzerland, in 1938. Should one or more of the members of the Permanent Committee not be in a position to attend, they should have the privilege of naming alternates.

The remaining \$22.84 to be used to defray, as far as possible, the expenses of the members of the Finance Committee in attendance at the final meeting, when the business of the Twelfth International Veterinary Congress was brought to a close.

The Committee wishes to express their appreciation for the efficient, painstaking and very laborious work of the Treasurer of the Congress, Dr. John R. Mohler, who not only aided materially towards the scientific success of the Congress, but also put forth arduous efforts in collecting a considerable portion of the funds.

(Signed) R. S. MACKELLAR, *Chairman*

(Signed) C. J. MARSHALL

(Signed) ADOLPH EICHHORN, *Secretary*

New York, N. Y., April 15, 1936.

Eastern Iowa Clinic

Elaborate preparations are being made for the annual clinic of the Eastern Iowa Veterinary Association, which will be held at Mechanicsville, Iowa, on June 17. This event has grown from year to year and attracts veterinarians not only from Iowa but from all nearby states. For further information, communicate with the secretary, Dr. J. J. Strandberg, 1005 Eighth Avenue, Belle Plaine, Iowa.

**73rd Annual Convention A. V. M. A.
Columbus, Ohio, August 11-12-13-14**



DELAWARE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Delaware Veterinary Medical Association was held in the Town Council Building, at Middletown, on December 27, 1935. Twelve active members and six non-members were present. Dr. Louis Levinson, president of the Association and Mayor of Middletown, opened the meeting with an address of welcome. As president, Dr. Levinson reviewed the work of the Association for the past year. He gave a detailed report of the successful efforts made to increase the compensation which practicing veterinarians receive from the State for the tuberculin-testing of accredited herds.

In the field of publicity for the profession, Dr. Levinson reported that, during the year, four radio talks were given by members of the Association: Dr. M. L. Zurkow, on anthrax; Dr. H. L. Fell, on rabies; Dr. H. P. Eves, on tuberculosis; and Dr. R. M. Sarde, on Bang's disease. President Levinson, who is very active in safety work in his community, also talked upon this subject and pointed out how members of the veterinary profession may play a very useful rôle in farm safety. To assist in this work, each member was handed a booklet dealing with the subject of farm safety.

Dr. E. B. Simonds, B. A. I. inspector in charge of tuberculosis and Bang's disease control in Maryland and Delaware, gave an interesting résumé of progress in the control of these diseases. He stated that he dislikes the use of the word eradication because it gives rise to a feeling of false security. In tuberculosis, the percentage of infected animals has been reduced to less than one-half of 1 per cent in many counties and states, but the disease has not been eradicated—it merely has been brought under control. Originating from centers containing only a small fraction of 1 per cent of infection, serious outbreaks may occur unless diligence is practiced on the part of the veterinary profession.

Dr. Mark Welsh, State Veterinarian of Maryland, was the guest speaker. He presented a paper upon "Current Disease

Problems." In dealing with Bang's disease, Dr. Welsh dealt chiefly with the economic aspects of the problem. In discussing encephalomyelitis, a disease which has been very much of a problem to Delaware veterinarians during recent years, Dr. Welsh reported that the western strain of the virus of this disease is spreading eastward and that, in the near future, Maryland and Delaware veterinarians will be forced to deal with cases infected with the western type, as well as cases infected with the eastern type. Dr. Welsh reported that field experiments with encephalomyelitis vaccine, carried out in Maryland last year, were inconclusive because, in the district where the vaccine was used, no natural outbreaks occurred. Another disease discussed by Dr. Welsh was swine erysipelas. This disease, which up to now has been found rarely in Maryland and Delaware, is increasing and may become an important swine disease in this part of the country.

Some of the discussion on Bang's disease which followed Dr. Welsh's paper may be worth reporting. Dr. Levinson believes the present control methods for Bang's disease (blood-testing) are not practical for the average herd-owner and advocates vaccination. Dr. C. C. Palmer reviewed his experiences with this disease, covering a period of more than 20 years. He reported that he was forced to adopt blood-testing and the removal of reacting animals in order to control the disease after what he considered as critical experiments with living-organism vaccine, used upon unbred heifers, had failed to control the disease. He stated that although many experiments and practical demonstrations have shown the feasibility and practicability of controlling the disease by blood-testing and the removal of reacting animals, and that by these methods the disease may be controlled just as effectively as tuberculosis may be controlled by the tuberculin test, there are at work powerful influences attempting to discredit the method, or at least to discourage its use.

But, with all of this opposition, the work of control based on blood-testing will go forward with increasing activity because of three very important reasons. First, many owners of purebred herds now have herds which are free of Bang's disease. These owners will never go back to Bang-infected herds and will continue to have their herds blood-tested and kept free of the infection. In the purebred cattle industry, owners who do not have clean herds are "out on a limb" as far as sales are concerned. This industry will continue to insist upon blood-negative herds even over the heads of veterinary officials. When the final chapter of the history of the control of this disease is written, if it

ever is, much of the credit for the success of the plan will go to the breeders who insisted upon the plan over the objections of veterinary officials.

Second, public health officials will continue to insist upon a milk supply from non-infected herds, as they do in the case of tuberculosis. The average herd-owner will consent to freeing his herd of this infection rather than go out of the dairy business. Third, states will continue to bar reacting cattle from other states. Dr. Palmer stated that it should prove just as profitable to the practitioner to collect blood samples, as it is to administer vaccines.

Dr. R. M. Sarde, of the State Board of Agriculture, presented a paper on the work the Board is doing in the control of Bang's disease. Dr. Sarde, who is in charge of this work, reported that the state health requirements for grade A milk have increased greatly the demands for testing work and that this, together with the government plan, was responsible for many herds coming into the Delaware plan, which is based on control by blood-testing.

The Association passed a motion relative to the method of selecting a delegate and an alternate to the House of Representatives of the A. V. M. A. New officers were elected as follows: President, Dr. C. C. Palmer, Newark; vice-president, Dr. H. P. Eves, Wilmington; secretary-treasurer, Dr. Charles I. Hock, Wilmington; Executive Committee, Drs. W. L. Parrott and R. M. Sarde, of Dover, and Dr. H. L. Fell, of Wilmington.

C. C. PALMER, *Secretary.*

SOUTH CAROLINA ASSOCIATION OF VETERINARIANS

The annual business meeting of the South Carolina Association of Veterinarians was held January 21, 1936, at the Jefferson Hotel, Columbia. Dr. L. J. Hogan, of Charleston, presided. After the banquet a report was received from the various committees, and officers were elected as follows: President, Dr. N. J. Ayers, Greer; vice-president, Dr. J. T. Dixon, Rock Hill; secretary-treasurer, Dr. R. A. Mays, Columbia.

Dr. Benjamin McInnes, of Charleston, resigned as an active member of the State Board of Veterinary Examiners on account of advanced age and declining health. Dr. M. R. Blackstock, of Spartanburg, was elected to take the place of Dr. McInnes. His appointment has been approved by the Governor. Dr. McInnes

was elected an honorary member of the Board of Veterinary Examiners.

R. A. MAYS, *Secretary-Treasurer.*

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The February meeting of the Veterinary Medical Association of New York City was our annual dinner get-together and was held at the Hotel New Yorker on Wednesday evening, February 19, 1936. This gathering was the most successful of its kind held by the Association for many years. The dinner was attended by 65 members and their friends and a truly sociable evening was had by all. The only speaker of the evening was the Rev. Hugh Shields, "An Original Connecticut Yankee Humorist," who, beyond a doubt, is a clever artist at after-dinner speaking, and was thoroughly enjoyed by all present.

MARCH MEETING

The March meeting was held at the Hotel New Yorker on Wednesday evening, March 4, 1936. At this time, we were fortunate in having as our guest and speaker, Dr. W. A. Hagan, Dean, New York State Veterinary College at Cornell University, who gave an address, "Planning for the Future in Veterinary Medicine." (Published in the April, 1936, issue of the JOURNAL, pp. 503-513.)

R. S. MACKELLAR, *Secretary.*

HOUSTON VETERINARY MEDICAL ASSOCIATION

The regular monthly meeting of the Houston Veterinary Medical Association was held at the Macatee Hotel, Houston, Texas, March 5, 1936, with 16 members present. After luncheon was served, Dr. W. M. Smotherman, of Huntsville, outlined his procedure for determining pregnancy in mares, and his technic for draining ovarian cysts.

Dr. M. Bader, of Galveston, demonstrated the use of a "cat board" for restraint, and a method of destroying cats by electricity. He also gave an interesting x-ray exhibition of a mouse in the stomach of a dog.

The semi-annual election of officers was held with the following results: President, Dr. W. T. Hufnall; vice-president, Dr. A. J. McKee; 2nd vice-president, Dr. Frank Hecker, and secretary and treasurer, Dr. D. B. Strickler, all of Houston. Dr. J.

Gilbert Horning, of Houston, was endorsed as a candidate for election to membership on the A. V. M. A. Executive Board for District 8.

Members of the Association are displaying excellent cooperation, and the meetings are well attended, with both practitioners and Bureau veterinarians taking an active part.

B. A. TAYLOR, *Secretary-Treasurer.*

GENESEE VALLEY VETERINARY MEDICAL ASSOCIATION

The regular meeting of the Genesee Valley Veterinary Medical Association was held at the Cadillac Hotel, Rochester, N. Y., March 11, 1936. Members of the Western New York Veterinary Medical Association were guests of the evening.

Following the dinner which was held at 6:30, Dr. Myron G. Fincher, of the New York State Veterinary College, conducted a general discussion, which consisted of questions relative to problems in general practice. Among these were case reports with requests for their diagnosis. Others were for further information on azoturia, periodic ophthalmia and the different forms of equine influenza.

A proposal was discussed for the affiliation of local societies with the New York State Veterinary Medical Society. Drs. F. L. Stein and L. J. Desson were appointed as delegates to a meeting, of representatives of other societies, which will be held to formulate a definite plan for affiliation.

A short discussion on "quackery" followed, and a brief report was made on a prosecution which had been started by the Association.

Dr. J. N. Frost, of the New York State Veterinary College, who recently returned from sabbatical leave, gave a very interesting talk on Europe and the British Isles. Dr. Charles M. Carpenter, of the Strong Memorial Hospital, furnished and explained some very interesting and instructive colored moving-picture films.

L. J. DESSON, *Secretary.*

NORTHWESTERN OHIO VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Northwestern Ohio Veterinary Medical Association was held at the Waldorf Hotel, Toledo, Ohio, March 12, 1936, with approximately 80 veterinarians present.

The program was opened with a discussion, "The Ohio Veterinary Practice Act," by Dr. Fred A. Zimmer, state veterinarian of Ohio. Dr. P. T. Engard, of Marysville, Ohio, gave a talk on "Poultry Practice," during which he presented a number of recommendations and suggestions for increasing the practice of the veterinarian in this field. Dr. E. C. W. Schubel, of Blissfield, Mich., read a paper entitled "Colics in the Horse."

Mr. S. R. Guard, editor of the *Breeder's Gazette*, gave a thorough discussion of the activities of the Graham Scientific Breeding School. Mr. Guard's work in this field was endorsed by the Association as being an endeavor to protect the live stock industry and to improve conditions for the veterinarian as well.

The summer meeting will be held at Tiffin, Ohio, June 21, 1936, and is to be a social one for members and their families.

WARREN P. S. HALL, *Secretary*.

MAINE VETERINARY MEDICAL ASSOCIATION

The regular spring meeting of the Maine Veterinary Medical Association was held at the Bangor House, Bangor, the evening of April 8, 1936.

Dr. R. E. Libby, of Richmond, presided over the short business session. It was voted to amend the section of the by-laws relating to honorary membership and to restrict this honor to members of the Association, only after they have retired from active practice.

The speakers of the evening were Dr. E. R. Hitchner, of the University of Maine, and Dr. S. W. Stiles, of Falmouth Fore-side. Dr. Hitchner described the difficult task of discovering suitable media for the propagation of various microorganisms. In his talk, he mentioned the fact that the Actinomycetes grow well on a beer medium and that other microorganisms thrive on a clam medium. The speaker compared a bacteriologist to the chef of a hotel. Dr. Stiles covered a number of practical points in connection with sterility, as encountered in his practice.

S. W. STILES, *Secretary*.

**73rd Annual Convention A. V. M. A.
Columbus, Ohio, August 11-12-13-14**

NECROLOGY



EDWARD MARTIN RANCK

Dr. Edward M. Ranck, of Lancaster, Pa., died at his home, February 15, 1936, after an illness of six weeks. He died of the results of a cerebral hemorrhage.

Born March 28, 1873, in East Earl Township, Lancaster County, Pa., Dr. Ranck received a public school education before entering the University of Pennsylvania. Immediately following his graduation, in 1897, he entered practice in Philadelphia. Shortly thereafter he accepted a position as veterinarian to the H. K. Mulford Company. This concern was, at that time, rapidly developing its business along the line of biological products and the animals used for this purpose were kept in a large stable in West Philadelphia. Later the biological manufacturing laboratories were moved to Glenolden, Pa.

In 1903, Dr. Ranck went to Mississippi as State Veterinarian and professor of veterinary science at the A. and M. College of that state. He remained in this work until the outbreak of the World War. He was appointed as Field Representative, Education and Recreation Branch, War Plans Division, General Staff, on September 1, 1919, serving as such until July 28, 1920. He was then appointed as Department Consultant, Educational and Recreation Branch, War Plans Division, and on July 1, 1921, as Educational Specialist, Advisory Board, War Plans Division, serving as such until June 30, 1922. During the period of his service with the War Plans Division, his status was that of a civilian. Dr. Ranck accepted appointment as Lieut. Colonel, Veterinary Corps Reserve, on March 10, 1924. He was on active duty as a Reserve officer at Carlisle Barracks, Pa., for short periods in 1924, 1926 and 1928, and in the Surgeon General's office, Washington, D. C., in 1927.

Dr. Ranck joined the A. V. M. A. in 1897 and was very active on various committees for almost 20 years. He served as resident secretary for Pennsylvania, 1900-01; as chairman of the Committee on Diseases, 1901-02; as a member of the Committee on Intelligence and Education, 1902-04; as a member (1902-03)

and as chairman (1903-04) of the Committee on Pharmacy; as a member of the Executive Committee for two terms (1902-03 and 1904-05); as third vice-president, 1902-03; as second vice-president, 1904-05; as resident secretary for Mississippi, 1903-04, 1907-09, 1911-15 and 1918-19; as a member of the Committee on Publications, 1904-07; as a member of the Committee on Re-



DR. E. M. RANCK

vision of By-laws, 1908-09, and as a member of the Committee on Audit, 1916-18.

In 1923, Dr. Ranck returned to civil life and entered general practice at Bird-in-Hand, Pa., later going to Lancaster. His hobby was fire prevention work. He was chairman of the Fire Prevention Committee of the State Firemen's Association, and held the same office in the Lancaster County Firemen's Association for ten years. Dr. Ranck's deep interest in this work, reflected in the activities of the two organizations with which he

was connected, attracted considerable attention in the East. He is survived by his widow, six children, his stepmother and a step-sister.

HARRY H. EXSTED

Dr. Harry H. Exsted, of Glencoe, Minn., died of an acute cardiac disease, December 17, 1935, at Newton, Iowa, while en route to Phoenix, Ariz., where he planned to spend part of the winter.

Born near Glencoe, Minn., January 15, 1887, Dr. Exsted attended the local public schools, then entered the Kansas City Veterinary College from which he was graduated in 1912. After graduation he returned to Minnesota and established a practice first at Paynesville, then Melrose, and later at Glencoe, where he continued his work until his death. He is survived by a widow, a son, five brothers and three sisters.

H. C. H. K.

C. D. TUTTLE

Dr. C. D. Tuttle, of Canton, S. Dak., died at his home, January 3, 1936, after an illness of almost a year, due to cancer of the liver. He was a graduate of the Chicago Veterinary College, class of 1902, and had been in general practice at Canton until a few years ago. For eight years he was a deputy state veterinarian and more recently had been in the employ of the U. S. Bureau of Animal Industry on drouth relief work and tuberculosis eradication in South Dakota.

Dr. Tuttle joined the A. V. M. A. in 1909. He is survived by three sons and a daughter. He had a wide acquaintance among the veterinarians of South Dakota and was well liked by everybody. His more intimate friends usually greeted him as "Old King Tut."

G. P. McC.

RUGLUS T. O'HARA

Dr. R. T. O'Hara, of Maxville, Ontario, died in a Montreal hospital, February 16, 1936. He had gone there for an operation and was apparently making a nice recovery when his heart suddenly failed him.

Born in Masham, Quebec, in 1881, Dr. O'Hara received his early education in the public schools and later entered the Ontario Veterinary College. Following his graduation in 1908, he

took over the practice of Dr. D. A. Irvine (Ont. '99), at Maxville. He served as food and sanitary inspector of Maxville for a number of years, and was always active in the social and civic life of the community. He was chairman of the High School Board of Trustees and was chief of the local volunteer fire brigade.

Dr. O'Hara joined the A. V. M. A. in 1916. He is survived by his widow (née Olive Munro), one son, two sisters and three brothers.

H. L. O'H.

SAMUEL CORN

Dr. Samuel Corn, of Philadelphia, Pa., died March 8, 1936. He was born in Philadelphia, July 12, 1867, and was educated in the public schools of that city. At the age of 43, he decided to study veterinary medicine and entered the University of Pennsylvania. Previously he had been engaged in breeding and handling dogs and was regarded as an excellent judge of dogs by many fanciers. Following his graduation in 1913, he specialized in small-animal practice in Philadelphia.

A. H. C.

LEVI FRANKLIN ORR

Dr. Levi F. Orr, of Burbank, Ohio, was found dead in bed at his home on March 28, 1936. He apparently was in his usual good health when he retired the night before. Angina pectoris was given as the cause of death.

Born in Canaan Township, Wayne County, Ohio, 73 years ago, he had spent his entire life in the vicinity of Burbank. He was graduated from the Ontario Veterinary College in 1887. He is survived by his widow and five children.

FLOYD L. BUCK

Dr. F. L. Buck, of Grand Junction, Iowa, died March 9, 1936, after a long illness.

Born near Ames, Iowa, on March 27, 1883, Dr. Buck attended the public schools of Ames and then entered Iowa State College for the study of veterinary medicine. He was graduated in 1911 and located at Grand Junction, Iowa, where he practiced until his death, except for the time that he served in the Veterinary Corps of the Army during the World War. He was commissioned as second lieutenant, July 5, 1917; promoted to first lieutenant,

November 22, 1917, and discharged November 27, 1918, after serving at the Remount Depot, Fort Royal, Va.; Eastern Purchasing Zone, Washington, D. C., and the Auxiliary Remount Depot, Fort Meade, Md.

Dr. Buck was commissioned as captain in the Organized Reserves, December 22, 1924. He is survived by his widow, one son and one daughter.

C. D. L.

GEORGE H. BERNES

Dr. George H. Bernes, of Brooklyn, N. Y., died at his home, February 15, 1936. About four years ago he had a bad fall, sustaining injuries from which he never recovered. He had been bedfast for most of this time.

Born in Loxten auf Brink, near Versmold, Germany, September 17, 1847, Dr. Bernes was educated in the local schools and the gymnasium at Bielefeld. He came to the United States in July, 1865. He studied veterinary medicine at the Columbia Veterinary College, in New York City. Following his graduation in 1879, he established an extensive practice at 74 Adams Street, Brooklyn. He continued in active practice until 1917, when he retired and was succeeded by Drs. R. W. Gannett (Corn. '05) and H. B. Risley (Corn. '09), who had been associated with him for a number of years. Dr. Bernes specialized in the diseases of heavy draft horses, and while he was in practice, he had under his care hundreds of horses of this type used in the metropolitan area. His hospital was one of the largest in the East.

Dr. Bernes joined the A. V. M. A. in 1884 and, in 1934, having completed 50 years of continuous membership, he was placed on the Honor Roll of the Association. For many years, he was a fairly regular attendant at A. V. M. A. conventions, and until recent years his name frequently graced the list of A. V. M. A. committees. He was a member of the Committee on Finance, 1891-92; member of the Committee on Local Arrangements for the 1899 meeting in New York City; a member of the Committee on Resolutions, 1901-02; chairman of the Special Committee of the Standards of Excellence and Soundness, 1902-04; member (1905-06, 1909-10, 1913-15 and 1927-28) and chairman (1906-07) of the Committee on Necrology; member of the Committee on the Association of Faculties, 1906-09; member of the Special Committee on the 50th Anniversary, 1911-13; and member of the special Committee on History, 1918-24. He was a

member of the New York State Veterinary Medical Society and served as president.

At the A. V. M. A. meeting in Philadelphia in 1927, a number of Dr. Berns' friends presented him with a gold-headed cane in commemoration of his 80th birthday. Last November, Dr. Berns was presented with a veteran's jewel by the Odd Fellows. It is



DR. GEORGE H. BERNS

reported that he was the oldest member of the Odd Fellows in this country at the time. He was a member of Principal Lodge of that order for 68 years. He was a member of the Bay Ridge Lodge, F. and A. M.; the Society of Old Brooklynites; the Presbyterian Men's Club, of Bay Ridge, and the Friday Night Men's Club.

On the night of the opening of the Brooklyn Bridge, Dr. Berns was called to the stable of one of his clients on Oak Street, in New York City. He mounted his saddle horse and proceeded to cross the bridge. At the entrance, he was told by an attendant that, although scores of military men had ridden over the bridge in the parade held that day, he was the first civilian to ride across. He had crossed the bridge many years before, using the swaying footpath. He made the trip in company with a few other venturesome men, including Reverend Henry Ward Beecher.

For many years Dr. Berns was a collaborator on the editorial staff of the *American Veterinary Review*. He is survived by his daughter, Miss Nellie C. Berns.

THOMAS RUFUS BRITT

Dr. Thomas R. Britt, of Newton Grove, N. Car., died in Highsmith Hospital, at Fayetteville, N. Car., November 28, 1935, following an attack of pneumonia. He was 45 years of age and unmarried. Following his graduation from the Kansas City Veterinary College, in 1915, he located at Newton Grove and practiced there up to the time of his death. During the World War he enlisted in the Veterinary Corps and was commissioned a second lieutenant, October 11, 1918. He was ordered to Camp Greenleaf for a course of instruction, and was discharged January 15, 1919, on account of physical disability. Dr. Britt was a Mason and a Woodman.

J. H. B.

I. A. ANDERSON

Dr. I. A. Anderson, of Stanhope, Iowa, was fatally injured March 22, 1936, when a shotgun was discharged accidentally as he was removing it from his car.

Born at Story City, Iowa, August 29, 1884, Dr. Anderson obtained his early education at Nora Springs, Iowa, High School. Later he attended Humboldt College and Iowa State Teachers College at Cedar Falls, Iowa. He then studied pharmacy at Iowa University and was graduated in 1910. For five years he conducted a drug store at Dow City, Iowa, and then entered the Chicago Veterinary College. Following his graduation in 1918, he located at Stanhope, Iowa, where he engaged in practice until his death.

Dr. Anderson was active in local civic organizations and was a member of the Board of Education and of the City Council at the time of his death. He is survived by his widow and one son.

C. D. L.

THOMAS EDWARD MUNCE

In the death of Dr. T. E. Munce, at Harrisburg, Pa., on March 17, 1936, the veterinary profession lost one of its really outstanding figures and the A. V. M. A. lost one of its staunchest supporters and hardest workers. Death came after an illness of over two weeks, as a result of pneumonia, later complicated by meningitis.

Born April 26, 1877, on a farm in Washington County, Pa., Dr. Munce attended country school until he was twelve years of age. Then the family moved to Washington, Pa., where he continued his preliminary education prior to entering Washington and Jefferson College. In 1896, he returned to the home farm and for five years he assisted his brothers in general farming and in breeding and raising purebred live stock. Then he decided to study veterinary medicine and entered the University of Pennsylvania.

Following his graduation in 1904, Dr. Munce returned to Washington and entered general practice there. Three years later, he was appointed one of the original meat hygiene agents of the Pennsylvania Live Stock Sanitary Board, under the direction of the late Dr. Leonard Pearson, then State Veterinarian. Dr. Munce was engaged in the state meat hygiene service and in general field work for about a year, when he was called to Harrisburg as special assistant to Dr. Louis A. Klein, who was then Deputy State Veterinarian.

In the fall of 1909, Dr. Klein was called to the University of Pennsylvania, as Dean of the School of Veterinary Medicine, to fill the vacancy created by the death of Dr. Pearson. Dr. Munce was then appointed Deputy State Veterinarian to succeed Dr. Klein. He continued in this position until 1917, when he was made Acting State Veterinarian, Dr. C. J. Marshall, State Veterinarian, having been called to military duty. In September, 1919, Dr. Munce was appointed State Veterinarian and Director of the Pennsylvania Bureau of Animal Industry, a position which he held until May 1, 1935.

Dr. Munce joined the A. V. M. A. in 1904. He served as the first secretary of the Section on Sanitary Science and Police,



THOMAS EDWARD MUNCE
April 26, 1877—March 17, 1936

1916-17 and, in 1918, was elected a member of the Executive Board from District 2. When the A. V. M. A. met in Philadelphia in 1918, he served as chairman of the Committee on Local Arrangements. In 1923, he was reelected a member of the Executive Board and in 1927 was chosen as chairman of the Board, serving as such, until his election to the presidency at the Minneapolis meeting, in 1928. During the year that he served as president, the A. V. M. A. enrolled 667 new members, the greatest growth during any one year since the war years (1917-19). When the movement was started to bring about some form of affiliation between the A. V. M. A. and the several state and provincial associations, Dr. Munce was appointed chairman of the special committee that had this matter in charge. Affiliation became an accomplished thing in 1934, when the House of Representatives met for the first time in New York. By common consent, Dr. Munce was selected to preside over the first meeting of the new body. The New York meeting was the twentieth consecutive meeting of the A. V. M. A. attended by Dr. Munce.

Equally active in the Pennsylvania State Veterinary Medical Association, Dr. Munce served that body as president for the year 1915-16 and then served for two years as secretary. In 1921, he was elected president of the United States Live Stock Sanitary Association, and year after year found him serving that organization on some important committee.

Dr. Munce never allowed his interest in his Alma Mater to wane. For many years he was the donor of a prize bearing his name, awarded annually to the senior student, who, during his four years, had attained the highest average in the courses on animal industry. In June, 1929, he was made a member of the Board of Directors of the General Alumni Society, a position he held until his death. In 1934, Dr. Munce was made chairman of the Departmental Committee of the Alumni Society of the Veterinary School, a body of 25 alumni whose duty it is to look after the welfare of the Veterinary School.

The *Pennsylvania Gazette*, of April 15, 1936, paid the following tribute to Dr. Munce:

Dr. Munce had a wide acquaintance among farmers, live stock breeders and dairymen of the State and by his sympathetic interest in their problems and his readiness to cooperate with them, he gained their confidence and support to a remarkable degree. He gave his best efforts to his official duties and with the help of the live stock and agricultural leaders and the veterinarians of the State he was instrumental in obtaining legislations and funds to extend the work when the need developed.

Dr. Munce was a member of the Harrisburg Rotary Club, the University Club of Harrisburg and the Harrisburg Chamber of Commerce. He was a member of the following Masonic bodies of Washington, Pa.: Lodge 164, Chapter 154, Council No. 3; Knights Templar, Commandery No. 3; also Consistory and Syria Temple, Mystic Shrine, of Pittsburgh. He is survived by his widow, one daughter and one son.

LOUIS WALKER CARL

Dr. Louis W. Carl, of Columbus, Ohio, died at his home, March 26, 1936.

Born in Columbus, April 14, 1866, Dr. Carl attended local schools and taught school before entering the Ontario Veterinary College. Following his graduation in 1891, he returned to Columbus and entered practice. About 1921, he discontinued veterinary work and entered the insurance business.

Dr. Carl joined the A. V. M. A. in 1918. He was a member of the Ohio State Veterinary Medical Association and was placed on the Honor Roll of this organization in 1917, after 25 years of continuous membership. He was also a member of the Grandview Community Lodge, F. and A. M., and the Franklin Lodge, Knights of Pythias. He is survived by his widow, one brother and one sister.

OSCAR RYDELL

Dr. Oscar Rydell, of Wheaton, Minn., died at his home on March 28, 1936. Death was the result of a coronary thrombosis. He suffered the first attack on January 9, 1936, while attending the winter meeting of the Minnesota State Veterinary Medical Society. On account of the seriousness of the attack, it was necessary for him to remain in a hospital in Minneapolis for an extended period. Improvement was slow, and he was not taken to his home until a short time prior to death.

Born April 23, 1869, in Sweden, Dr. Rydell was educated in the public schools of his native country and when 19 years of age he emigrated to the United States. He studied veterinary medicine at the Chicago Veterinary College from which he was graduated in 1894. Following his graduation, he located for general practice at River Falls, Wis. In 1898, he moved to Wheaton, Minn., where he practiced his profession continuously for 38 years.

Dr. Rydell was a member of the Minnesota State Veterinary Medical Society. He was faithful and conscientious in his profession. To his colleagues he was ever-ready to lend assistance. His advice, always cheerfully given to younger veterinarians, was timely and good. He is survived by his wife, three sons, one of whom, Robert (Iowa '34), is a veterinarian, one brother and two sisters.

R. F.

JAMES R. BROWN, SR.

Dr. James R. Brown, Sr., of Peoria, Ill., died at his home, March 28, 1936, after an illness of only three hours.

Born at Prall, Ohio, July 10, 1868, Dr. Brown studied veterinary medicine at the Cincinnati Veterinary College. Following his graduation in 1910, Dr. Brown entered the employ of the U. S. Bureau of Animal Industry, was assigned to meat inspection, and continued in the service until about five years ago, when he was retired.

Dr. Brown was a member of the Mississippi Valley Veterinary Association. He is survived by his widow (née Katie M. Swable), four daughters and one son, Dr. J. R. Brown, Jr. (O. S. U. '20), of Ottawa, Ill., president of the Illinois State Veterinary Medical Association.

WRAITH H. McKENZIE

Dr. W. H. McKenzie, of Columbus, Ohio, died at his home, April 11, 1936, after an illness of almost a year.

Born at Wilmington, Ohio, July 16, 1878, Dr. McKenzie received his elementary education in Clinton County and at Wilmington College. After teaching school for ten years in Clinton County, he decided to study veterinary medicine at Ohio State University. He was graduated in 1913 and immediately entered the service of the U. S. Bureau of Animal Industry. He was assigned to various projects of contagious disease eradication and was one of the pioneers in the control and eradication of tuberculosis. Dr. McKenzie did outstanding work when connected with this project in Ohio. He remained in this work until 1927, when he resigned, to become the Ohio representative of the Corn States Serum Company.

Dr. McKenzie joined the A. V. M. A. in 1928. He was a member of the Ohio State Veterinary Medical Association, the Northwestern Ohio Veterinary Medical Association, the Tri-County

Veterinary Medical Association, the Spanish American War Veterans, the Columbus Gun Club, the Masonic Lodge of Shoshone, Idaho, and of the Scioto Consistory and Aladdin Temple of Columbus. He is survived by his widow (née Edith E. Murphy), one son, Dr. Carl V. McKenzie (O. S. U. '33), one daughter and two sisters.

A. J. DeF.

PROF. NAOSHI NITTA

Professor Naoshi Nitta, of the Laboratory of Veterinary Pathology and Bacteriology, Agricultural College, Imperial University of Tokyo, Tokyo, Japan, died very suddenly at his home, January 23, 1936, following a stroke of apoplexy. He had been an honorary member of the A. V. M. A. since 1928 and was the Japanese member of the Permanent Committee of the International Veterinary Congress.

Our sympathy goes out to Dr. Calvin S. Evans, of Appleton, N. Y., in the death of his wife; to Dr. C. L. Miller, of Oak Park, Ill., in the death of his father, in an automobile accident, recently; to Dr. William L. Farley, of Peru, Ind., in the death of his mother, at Stockbridge, Mass., April 17, 1936; and to Dr. W. F. Christopher, of La Porte City, Iowa, in the death of his wife, April 26, 1936.

PERSONALS

MARRIAGE

DR. LLOYD DIEHL JONES (Iowa '31), of Rochelle, Ill., to Miss Helen Josephine Lacroix, of Evanston, Ill., at Oregon, Ill., April 17, 1936.

BIRTH

TO DR. and MRS. JOHN M. COFFIN, of Peekskill, N. Y., a son, David Medory, September 20, 1935.

PERSONALS

DR. H. J. WEAVER (Ind. '17) has resumed his practice at Hagerstown, Ind.

DR. W. J. PRICE (K. S. C. '31) has removed from Woodward, Okla., to Blair, Nebr.

DR. R. T. LUTZ (O. S. U. '17) has removed from Stoutsville, Ohio to Thornville, same state.

DR. R. A. MILLER (Ind. '17), formerly of Hagerstown, Ind., has returned to Indianapolis.

DR. M. J. SMITH (Wash. '32) has removed from Mount Vernon, Wash., to Tillamook, Ore.

DR. WILLIAM N. KRAMER (O. S. U. '35), recently of Dayton, Ohio, is back in Los Angeles, Calif.

DR. WILLIAM H. PAVEY (O. S. U. '30), formerly of Sabina, Ohio, has opened an office at Xenia, Ohio.

DR. D. E. WISHARD (Ind. '11), formerly of Houston, Texas, has moved to Waxahachie, same state.

DR. H. B. THOMSON (Iowa '19), formerly of Danbury, Iowa, has located for practice at Postville, Iowa.

DR. OSCAR J. KRON (N. Y.-Amer. '07) is vice-chairman of the Sunshine Committee of the San Francisco Rotary Club.

DR. MONTE C. SMITH (U. S. C. V. S. '15) has returned to his home in Cedar Rapids, Iowa, from tuberculin testing in Texas.

DR. NEWTON B. TENNILE (O. S. U. '33) reports a change of address from Norwalk, Ohio, to 3165 Sylvania Ave., Toledo, Ohio.

DR. HENRY H. MABRY (O. S. U. '34), has located at Lodi, Ohio, for general practice, after a year and a half in government service.

DR. LISLE A. GRAY (O. S. U. '32), of Bushnell, Ill., is erecting a modern veterinary hospital on the lot just west of his present location.

DR. S. S. SEVERN (K. C. V. C. '11), of Seguin, Texas, is a member of the newly appointed Medical Milk Commission of Caldwell County, Texas.

DR. W. C. SCOTTEN (Chi. '16), formerly of Kirkwood, Ill., has removed to Monmouth, Ill., where he has established an office and hospital for small animals.

DR. WILLIAM E. ADAMS (Ont. '93), of Carson City, Mich., announced his retirement from active practice on March 29, after 43 years of service to his community.

DR. C. I. CORBIN (Corn. '11), of Leonia, N. J., presided at the annual meeting of the Metropolitan Certified Milk Producers' Association, in New York City, February 3.

DR. W. B. MASSIE (Mich. '16), of Boston, Ind., addressed the Young Men's Farming Club, of Lewisburg, Ohio, at the March 30 meeting, on "Internal and External Parasites of Horses."

DR. JOHN KEPPEL (McK. '02), of Zeeland, Mich., has accepted a position as meat inspector for the City of Grand Rapids and is stationed at the Grand Rapids Packing Company plant.

DR. ROBERT S. MACKELLAR, SR. (N. Y. C. V. S. '94), of New York, N. Y., accompanied by Mrs. MacKellar, sailed on the SS. *Brittanic*, March 11, for a 15-day cruise of the West Indies.

DR. CHAS. A. PYLE (K. S. C. '07), formerly of Sedan, Kan., has removed to Independence, same state, where he has entered general practice in partnership with Dr. B. A. Robinson (Ont. '00).

DR. JOHN G. HARDENBERGH (U. P. '16), of the Walker-Gordon Laboratory Company, Plainsboro, N. J., gave a lecture before the third-year medical students at the University of Pennsylvania, on January 31. His subject was "Dairy Hygiene and Milk Sanitation."

DR. ROBERTO PLATA GUERRERO (U. P. '20), formerly director of the Laboratory of Infectious Diseases, School of Veterinary Medicine, Bogota, Colombia, is now located at Guayaquil, Ecuador, where he is working on investigations of tropical infectious and parasitic diseases of live stock.